THE IMPACT OF A TQM INTERVENTION ON WORK ATTITUDES: A LONGITUDINAL CASE STUDY

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THESIS ABSTRACT

Total Quality Management (TQM) has been heralded as a new way of managing organizations. While there are widespread endeavours by organizations to implement TQM, a visible lag exists between the adoption of TQM and a systematic evaluation of this phenomenon. The thesis, therefore, addresses a fundamental question in TQM; what is the impact, if any, of a TQM intervention on employee work attitudes?

This 'before and after study' examines the impact of a 'soft' TQM intervention on two key elements of TQM: teamwork and continuous improvement. A questionnaire was completed by respondents six months prior to and nine months after the launch of the intervention. The starting point in the evaluation is the development of theoretical models containing hypothesized antecedents of teamwork and continuous improvement which are empirically tested on the data. The intervention is then evaluated on the basis of its direct and indirect effects on the two key elements of TQM. In addition, the impact of the intervention is assessed both at the individual and the organizational level.

At the individual level, the intervention was found to have a significant effect on team orientation as well as on a number of dimensions of continuous improvement, including general orientation to quality, improvement as part of the job and intrinsic motivation. However, a significant overall improvement at the organizational level was not evidenced in any of these variables. This raises the possibility that a longer time lag may be required for the individual level effects to develop into an overall organizational improvement.

Additional important findings emerged from this evaluation. First, a consistent finding throughout is the importance of supervisory behaviour in affecting employee attitudes. Second, employee assessment of the intervention is a more significant predictor of subsequent changes than employee participation in the intervention *per se.* Finally, the prior experience and attitudes of individuals have a significant effect on how the intervention is assessed, which subsequently affects changes in attitudes, highlighting the fact that organizational change interventions do not occur in a vacuum.

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Chapter 1: Total Quality Management: Theory and Research

1.1 Introduction

Total Quality Management (TQM) has been heralded as a new way of managing organizations. While it has generated considerable interest from the practitioner community academic interest has lagged behind. It is not uncommon for a considerable lag to exist between innovations adopted by organizations and their systematic evaluation. As such, TQM is no exception. The view presented by Steel and Jennings (1992) is still widely applicable to TQM research, *"there are no systematic and controlled studies of the TQM process"* (p25). However, a few evaluation studies have recently been conducted (Guest and Peccei, 1994; Peccei and Wood, 1994; Wood and Peccei, 1995).

The absence of evaluation research may in the most part be due to the nature of TQM. By its very nature, TQM is difficult to evaluate. There are several reasons for this. First, TQM, as a concept is ill defined and related to this, it has little theoretical foundation to guide evaluations. Second, the intended scope of TQM change exceeds the more typical organizational change interventions (Steel and Jennings, 1992). Third, the multifaceted nature of TQM makes it difficult to isolate the effects of individual changes. Finally, any scientific evaluation of TQM would have to adopt a longitudinal approach and overcome the unique potential problems inherent in undertaking longitudinal studies.

Overall, relatively little is known about whether TQM works; whether it does indeed bring about the desired positive changes in attitudes, behaviour and performance as claimed by its proponents. This thesis sets out to evaluate a TQM intervention and

thereby makes its contribution by addressing a fundamental question: does TQM affect work attitudes? More specifically, does TQM have an impact on two core attitudes: teamwork and continuous improvement?

On the surface, the research question seems straightforward and typifies evaluation driven research. However, and particularly important in the case of TQM, the research question raises a further question in terms of evaluation: how can the impact of TQM be assessed given the lack of theoretical propositions underlying TQM which might serve as a guide to empirical research? In specific terms of this research, how does one begin to evaluate the impact of TQM on teamwork and continuous improvement without an explicit set of theoretical underpinnings and propositions to guide such an evaluation?

In view of this, the starting point for this evaluation is the development of theoretical models containing hypothesized antecedents of teamwork and continuous improvement. These models are empirically tested prior to their subsequent use as a basis for guiding an examination of the impact of TQM on teamwork and continuous improvement. Therefore, the thesis goes some way towards supplementing the theoretical basis underlying TQM as well as empirically evaluating the impact of TQM on attitudes.

The aim of this chapter is to present a critical overview of TQM theory and research. In doing so, the chapter sets out to accomplish the following. First, to provide a rationale for investigating TQM prior to examining the nature of TQM. Second, to critically analyse the theoretical basis of teamwork and continuous improvement. Finally, to place this research in context by reviewing, in broad terms, the empirical research

conducted to date in TQM. In closing, the research questions are presented and the structure of the thesis is outlined.

1.2 Why investigate TQM?

TQM has been heralded as a "new world order" organizational role model (Boje and Winsor, 1993). Grant et al. (1994) view TQM as an emerging and distinct management paradigm that contrasts sharply with the economic model of the firm. In this sense, TQM is portrayed as a philosophy, "*it is the company's raison d'être*" (Grant et al., 1994, p28). Adopting this interpretation, the authors subsequently argue that *"implementation of TQM therefore provides challenges similar to those involved in the management of other revolutionary transitions. The management problem with TQM is analogous to the problems associated with introducing representative democracy into former autocracies and introducing equal rights into racially segregated societies...."* (Grant et al., 1994, p34).

Other proponents equating TQM with a "new paradigm", a humanistic, systems approach to management (Brocka & Brocka, 1992), depict customer driven organizations that are organised around processes and run by teams (Slater, 1991). Ross (1993) goes further to assert that *"no management issue since the Scientific Management Movement of Frederick Taylor in 1907 has had the impact of the quality movement"* (p2). Therefore, TQM is seen as revolutionary compared to the principles espoused by the classical management theorists. Clearly, whether TQM can be assigned new paradigmatic status depends on how TQM is interpreted and how it compares to a reference paradigm. If one views TQM as a sophisticated modernized repackaging of Taylor's Scientific Management (Boje and Winsor, 1993), then it would be difficult to subscribe to the view of TQM as a new paradigm.

There is evidence that a new practitioner paradigm is emerging that is characterised by debureaucratization, downsizing, delayering and decentralization (Kanter, 1992). However, it would seem that while TQM may not embody all the characteristics of this emerging paradigm, Hill and Wilkinson (1995) argue that TQM *"assists the transition from bureaucratic to more lissom organizations"* (p21). Spencer (1994) argues against viewing TQM as a new paradigm. In her analysis, she compares TQM to three models of organizations: mechanistic, systems and cultural. In doing so, the linkages between TQM and the three models are made explicit. Dean and Bowen (1994) hint at a similar view asserting that there is considerable overlap between TQM and management theory and conclude that TQM is a *"ubiquitous organizational phenomenon that has been given little research attention"* (p393).

The debate surrounding TQM as a distinct management paradigm partly reflects and concurrently is affected by a lack of consensus as to what TQM means. As such, it is quite common to see TQM equated with or described as hazy, ambiguous, (Dean and Bowen, 1994) and notoriously imprecise (Hill and Wilkinson, 1995). The lack of a clear conception of what TQM means is not surprising given that the meaning of the term "quality" is still being debated (Reeves and Bednar, 1994). Despite the plethora of written material that exists, why is TQM such an elusive concept?

There is no doubt that the contributions of the "founding fathers[1]" of TQM have paved the way for the ambiguity and fuzziness surrounding TQM. This is a result of distinct differences in their approach and prescription. For example, there is a clear divergence between the proponents on the role of employees; Crosby (1979) assigns a minimal role while Ishikawa (1985) gives greater emphasis to the contributions of employees in the

[1] There is agreement that this categorization would include Crosby (1979), Deming (1986), Feigenbaum (1983), Ishikawa (1985) and Juran (1989).

process of continuous improvement. Hill and Wilkinson (1995) highlight other factors that have played a role in adding to the chameleon like qualities of TQM. Practitioners have used TQM as an umbrella term to describe a varied range of practices. Steel and Jennings (1992) argue that *"there are almost as many approaches to TQM as there are TQM practitioners"* (p31). The third factor is the theoretical basis of TQM in statistics in comparison to the broad social science base of the majority of contributions to management theory. The consequences of TQM's theoretical grounding (or lack of such) is pursued later in this chapter.

The chameleon like qualities of TQM are reinforced by Spencer (1994) who argues that TQM *"is not a cut-and-dried reality but an amorphous philosophy that is continuously enacted by managers, consultants and researchers who make choices based not only on their understanding of the principles of TQM but also on their own conceptual frameworks concerning the nature of organizations"* (p448). A case in point is the recent entry of the notion of empowerment into TQM. To my knowledge, the term is not widely evident in the earlier contributions in TQM[2] while Hill and Wilkinson (1995) note that it is rarely used in the quality management literature[3] However, in more recent contributions[4], it is not only evident but has sparked considerable debate as to whether, in fact, TQM is a vehicle of empowerment.

[2] By early work on TQM, I am referring to the contributions of Crosby (1979, 1986), Juran (1989), Ishikawa (1985), Deming (1986) and Feigenbaum (1983).
[3] The authors note that Oakland (1989, p320) refers to empowerment.
[4] See for example Grant et al. (1994) and Cruise O' Brien (1995) for TQM as a source of empowerment and Parker and Slaughter (1993) and Sewell and Wilkinson (1992) for a contrary view.

1.3 What is TQM?

Putting aside the opposing views of TQM as a new paradigm, how has it been defined? At a broad level, it has been defined as a way of managing, a philosophy of management (Brocka and Brocka, 1992; Dean and Bowen, 1994; Hill, 1991a; Hill and Wilkinson, 1995; Lawler, 1994) and a systems approach to the practice of management (Olian and Rynes, 1992; Ross, 1994). There is also agreement that no single theoretical formulation of TQM exists (Hill, 1991a; Lawler, 1994; Sashkin and Kiser, 1993) nor is there *"a definitive shortlist of practices that are associated with it"* (Lawler, 1994, p68).

Defining TQM as a systemic approach to managing an organization or a philosophy of management is not particularly informative. Thus, one needs to ask, how has TQM been characterised? In quite simple terms, TQM can be viewed as comprising a systems and a cultural component. The first component would include improvement tools, measurement systems and a quality infrastructure.[5] The latter would include quality oriented attitudes, values and behaviours.[6] Schein (1985) would argue that these two components are not and should not be treated as separate but rather the systems component would be a manifestation of the underlying cultural assumptions.

An organization is said to have to change its culture to facilitate and support TQM (Brocka and Brocka, 1992; Sashkin and Kiser, 1993; Waldman, 1994). Hill (1991b), for example, argues that *"cultural change is the ultimate objective of quality management"* (p557). What would the notion of a total quality culture consist of ? In other words,

[5] This would include improvement teams, cross functional teams, increased customer contact and more autonomous work units.

[6] This interpretation of culture is oversimplified and does not reflect a more elaborate interpretation (Schein, 1985) nor does it challenge the notion that culture can be managed (Meyerson and Martin, 1987).

what are the cultural values that are important to TQM? Sashkin and Kiser (1993) outline eight elements of a TQM culture to include, for example, job security, a climate of fairness, ownership stake for employees, and co-operation as a basis for working together. Hill (1991b) directs attention to the following elements: *"internalization of quality and continuous improvement as the goal of all activities....more open communications....greater involvement....the creation of high-trust social relationships....absolute priority of customer satisfaction"* (p555). In addition, a move from individualism to team orientation, from an autocratic management style to supportive leadership are other cultural values that have been identified as part of a quality culture (Blackburn and Rosen, 1993).

As can be seen, a number of different cultural dimensions have been put forward as important to TQM. Some of these dimensions are interrelated (for example, more open communications and the creation of high-trust relationships) and arguably, some are more fundamental to TQM than others (for example, continuous improvement compared to ownership stake for employees). Giving attention to each of the dimensions portrayed as important to TQM may unduly complicate and overshadow the essence of TQM. Therefore, the following discussion concentrates on what have been put forward as the core elements of TQM.

1.3.1 Core elements of TQM

Can TQM be accurately portrayed by a number of key elements? The inherent danger in reducing TQM to a number of key principles is that the complexity and far reaching scope of TQM is not accurately reflected. However, by concentrating on a number of key elements, the essence of TQM can be more easily explicated. Dean and Bowen

(1994) assert that TQM is based explicitly or implicitly on three fundamental principles: customer focus, continuous improvement and teamwork. To a large degree, Hill and Wilkinson (1995) present a similar interpretation of the underlying key elements of TQM; these include customer orientation, continuous improvement and process orientation. The former writers subsumed the principle of process orientation in continuous improvement. Although teamwork is excluded as a key element by the latter writers, there is sufficient support for the importance of teamwork elsewhere (Bowen and Lawler, 1992; Deming, 1986; Hill, 1991b; Wilkinson, 1994). Brocka and Brocka (1992) argue that *"without teamwork, Quality Management is finished before it can start"* (p11). Thus, it may be more accurate to describe TQM as consisting of three primary but also a number of secondary elements[7] that support and facilitate the primary elements.

Why are these principles so important to TQM? First and foremost, these principles are not independent but mutually interdependent. For example, the pursuit of customer satisfaction (internal or external) may stimulate or provide ideas for improvement which in turn may require teamwork or co-operative activity between individuals, groups or departments in order to implement these improvements. Therefore, while customer satisfaction is the ultimate goal and continuous improvement is the vehicle by which this is achieved, continuous improvement in itself relies on teamwork.

Continuous improvement requires all organizational members to be motivated to improve the status quo. In essence this requires a constant questioning and examination of existing processes in the search for more effective and efficient means of doing things. As such, commitment to improvement becomes an integral part of an individual's job; that is, an individual is not only required to carry out his/her specific

[7] These secondary elements may include for example, more open communications, job security, participative management style, collectivist orientation and increased quality awareness.

tasks but also to think in terms of how he/she can improve his/her work and that of his/her work group. In addition to this value or attitude, there needs to be a supporting system or infrastructure. This could take the form of continuous improvement teams or at the specific job level, statistical process control methods. Both the value system and infrastructure are mutually dependent. An individual committed to continuous improvement needs a vehicle to translate ideas and suggestions into practice and this may be accomplished through his/her participation in an improvement structure.

Teamwork is interpreted in the widest sense. This includes intragroup teamwork, interdepartmental teamwork, hierarchical teamwork between management and employees and finally, interorganizational teamwork between customers and suppliers. Underlying these forms of teamwork is the notion of co-operative activity. Unless one has total autonomy over one's work, co-operative activity is necessary to implement improvements. This is particularly important if an organization's activities are viewed as an interdependent set of processes. Therefore, a restructuring of work away from the individual toward a team will highlight interdependence which requires an element of co-operation.

The notion of interdependence is reinforced with the internal customer-supplier principle. Employees are expected to view themselves and act accordingly as suppliers of the next person in the supply chain and customers of the preceding person in the chain. As Wilkinson (1992) notes, this customer focus is designed to highlight an individual's contribution to the final customer. Therefore, teamwork and co-operation are essential at all links in the chain from the initial contact with the external customer through to the satisfaction of the external customer requirements. *"Terms such as internal customer may reshape members' ideas not only about the relevant*

organization of work teams, but also about the purpose and importance of their tasks" (Spencer, 1994, p467).

These three principles of customer focus, continuous improvement and teamwork may be thought of as comprising a "soft" and "hard" component relating to a cultural and system dimension. In this sense, soft may be interpreted as values or attitudes while "hard" relates to the visible mechanisms or structures. For example, commitment to improvement as an attitude and quality improvement teams as the parallel structure. In the case of teamwork, a team orientation is paralleled with work restructuring around the team or cell.[8] A customer orientation is reinforced by internal customer-supplier audits and by direct contact with customers.

1.4 A critical analysis of the core elements

The previous section has highlighted what have been portrayed as the important elements of TQM. This section critically analyses two of the three elements that are the focus of this research: teamwork and continuous improvement. The rationale for concentrating on two of the three interrelated elements of TQM is twofold. First, the intervention (discussed in the subsequent chapter) being evaluated primarily focused on teamwork and continuous improvement. Second, as outlined at the beginning of this chapter, the starting point in this evaluation is the development of theoretical models containing hypothesized antecedents of the key elements. This requires the measurement of potential antecedents as well as the key elements. In turn, this has practical implications for the length of the questionnaire. Consequently, an attempt to measure the three elements as well as their hypothesized antecedents would require a longer questionnaire which in this case was not deemed feasible. As with any research,

[8] This is characterized as a series of self contained mini factories within the factory.

a trade-off was made between what was practical in light of the intervention and what was portrayed as important elements of TQM, in theory.

1.4.1 Theoretical basis

TQM cannot be considered as having an explicit theory; that is, a clear set of theoretical underpinnings and propositions. This lack of theory is widely recognised and recently, Dean and Bowen (1994) have argued that theory development is needed to stimulate empirical research and empirical research should be more productive if there is a theoretical base to draw on. Sitkin et al. (1994) assert that an inductive strand of research is warranted whereby from the practices of TQM, implicit theories may be extracted and made explicit. One of the mechanisms that could assist this is longitudinal research that examines the effects of TQM interventions. A more ambitious recommendation for future research is the development of a unified TQM theory (Steel and Jennings, 1992).

A more critical perspective is adopted by Drummond and Chell (1992) who warn that TQM could become another discredited initiative if it ignores research findings from disciplines such as Organizational Behaviour (OB). Kerfoot and Knights (1995) go further to argue that TQM is fundamentally flawed by the inherent contradictions that arise in the implementation of TQM initiatives. *"These contradictions may be seen to derive from the crude and mechanistic 'engineering-like' model of organizations and the equally simplistic understandings of human behaviour that inform TQM"* (Kerfoot and Knights, 1995, p220).

There is an implicit assumption that a TQM initiative will be interpreted similarly by employees and also, that they will respond in a similar manner. Thus, there is a lack of

attention paid to individual differences and the role these differences play in how employees perceive and respond to TQM interventions (Kerfoot and Knights, 1995). This type of assumption reflects and is indicative of the embryonic stage of theoretical development of TQM. What affects teamwork and commitment to improvement? There is no explicit set of theoretical propositions within the TQM framework that help explain why some individuals may have a stronger team orientation than others or why some individuals may be more committed to improvement than others. In other words, what are the antecedents of teamwork and commitment to improvement? More fundamentally, what does teamwork and commitment to improvement mean? These questions largely remain unanswered in the TQM literature.

1.4.2 Teamwork

If teamwork is applied to the work group, what does this mean? It is widely used in the TQM literature and its meaning is assumed to be self evident. However, teamwork can represent a form of work design based on a group or it may be interpreted as an individual's orientation toward the group and how individuals within the group interact. Therefore, the two interpretations reflect a 'hard' and 'soft' dimension; that is, the former emphasizes the structure while the latter emphasizes teamwork as a value or attitude. In terms of labelling, the latter dimension may be better reflected under the guise of team orientation. Work may be structured around a team thus highlighting the interdependence of tasks and the importance of co-operative activity. However, is work restructuring enough to create a 'team spirit' within the group?

It would seem that if there is any theoretical basis to team orientation in TQM, it is likely that an assumption is held that work redesign around the team will lead to team orientation. However, Wickens (1995) argues that teamwork and work groups are

distinctly different. *"Teamworking is a culture; work groups are about structures"* (p119). Furthermore, creating a work group structure does not automatically mean that teamwork will result. Teamwork in this sense is analogous to team orientation. There is no explicit theory underlying team orientation in TQM. This raises a number of issues. First, what are the antecedents of team orientation? Contrary to the broad assumption underlying TQM that individuals will adopt values and attitudes in a similar manner (Kerfoot and Knights, 1995), what differentiates individuals in terms of their team orientation? Second, does a TQM intervention lead to a significant improvement in team orientation? If so, how and why does this occur?

These questions are left unanswered in the TQM literature and furthermore, there is a scarcity of empirical research that systematically addresses these issues. Cruise O' Brien (1995) found that employees were more willing to exert effort on behalf of their team rather than the organization. What the study does not address is the factors that affect team orientation.

Research findings from other areas would suggest that there are antecedents of team orientation. These are dealt with more fully in chapter 4 but for the purpose here, two factors serve to illustrate the existence of possible antecedents. First, interpersonal trust has received scant attention in the TQM literature (an exception would include Hill, 1991b) and this has been found to have an effect on team cohesiveness and co-operation (Golembiewski and McConkie, 1975). The greater an individual's trust in their colleagues, the more likely that he/she will hold a stronger team orientation. In a similar vein, the role of the supervisor may influence or shape an individual's orientation toward the work group. This underlies Human Relations theory which proposes that leaders using participation can develop work group members into a working team with high loyalty (Likert, 1961). Thus, in theory, it is possible to identify

factors that may affect an individual's attitude toward the team. From this, one would not necessarily expect all individuals to have a similar team orientation as a result of a TQM intervention.

How would a TQM intervention affect team orientation? If the above holds true; that is, trust and the participative style of the supervisor affects team orientation, then if the intervention affects trust and participative style, there is one possible linkage (in theory) between TQM and team orientation. While the TQM literature is quite explicit in its prescription of change for supervisory behaviour, it does not link this change to specific changes in team orientation of subordinates.

Therefore, in theory, there are possible antecedents of team orientation and it is possible that a TQM intervention may affect team orientation through these antecedents. Consequently, while the TQM literature does not provide an explanation of how team orientation may be affected, it would seem that by borrowing from previous research findings and theoretical insights, this gap may be filled.

1.4.3 Continuous improvement

A critical assessment of commitment to improvement is further complicated by different contributors emphasizing different concepts. Specifically, some writings emphasize intrinsic motivation and others continuous improvement.

In theory, employee commitment to improvement represents a change in their work; they are not only required to do their job in the most efficient and effective manner but also think of ways in which their work and that of their work area may be improved. Thus, placing the onus on employees for improvements adds an additional component

to their work. Therefore, if one equates eliciting commitment to improvement with redesigning work, will all employees respond in a similar manner by integrating the search for improvements into their daily tasks?

TQM requires the participation of all organizational members in the pursuance of continuous improvement. Overall, there is a consensus that total involvement is a requirement (Ishikawa, 1985; Lawler, 1994; Oakland, 1989) translating into an organizationwide commitment to continuous improvement. Financial incentives to induce employee participation in TQM or commitment to continuous improvement are completely eliminated by many of the quality proponents (Crosby, 1979; Deming, 1986; Oakland, 1989). This type of inducement *"does not form part of a TQM culture, and would defeat many of the objectives"* (Oakland, 1989, p303). Hill and Wilkinson (1995) assert that *"the belief of the quality gurus is that people need to buy into TQM without coercion, because they have internalized a commitment to quality management and voluntarily pursue the appropriate principles and practices"* (p14). In particular, TQM proponents are highly critical of conventional performance related payment systems that focus on the individual. First, TQM proponents argue that individual performance related pay systems focus an individual's attention and effort on obtaining the rewards and consequently, individuals may attempt to set less challenging goals. Kohn (1993) argues that this type of reward elicits temporary compliance, it does not create an enduring commitment to any value or action. Second, individual self interest may be pursued at the expense of teamwork and continuous improvement.

Kelman (1958) argues that high levels of commitment are dependent upon the individual internalizing the organization's goals and values. In the context of TQM, this involves the internalization of values such as teamwork and continuous improvement. The use of reward systems to elicit desired behaviours results in

compliance which negates the desired result of commitment (Drummond and Chell, 1992). Therefore, the use of coercion and sanctions goes against the commitment that TQM seeks to achieve.

What happens in practice? Do employees internalize the values of continuous improvement? Do they voluntarily and willingly participate in TQM? Recent case study evidence (McArdle et al., 1995) questions the willingness of employees to voluntarily participate in Quality Circles (QCs). While membership in QCs was voluntary, overt and covert encouragement was given to employees to participate. At this particular plant, wage increases for employees were based on performance comprising a quantitative and qualitative element. In terms of the latter component, this was assessed on behavioural characteristics. *"Being a member of a quality circle and taking an active part in the quality process is seen as desirable behaviour, which will be rewarded accordingly"* (McArdle et al., 1995, p162). Moreso, there is a hint that the idea of voluntary participation is no longer appropriate. Soin (1992), an advocate of total quality, argues that in today's competitive environment, *[employee]"participation is no longer voluntary-it is essential for success"* (p 211).

This raises a question of how employee commitment to continuous improvement is achieved. What factors affect an individual's commitment to continuous improvement? If commitment to improvement involves changing the nature of jobs, research on work redesign (Hackman and Oldham, 1980) may serve as a guideline. Not all individuals will respond similarly to work redesign. In particular, an individual's higher order need strength has been found to moderate the relationship between work redesign and its associated outcomes. Consequently, one could hypothesize that an individual's higher order need strength may influence how individuals respond in terms of their commitment to improvement. From this, individuals with a greater need for

achievement and satisfaction through work may be more likely to be committed to improvement.

Along similar lines, an individual's commitment to the organization may have a positive effect on commitment to improvement. Recent empirical evidence suggests that organizational commitment has a significant positive impact on quality consciousness (Peccei and Wood, 1994; Wood and Peccei, 1995). Therefore, if commitment to continuous improvement is perceived to be a significant value or goal in the organization, one could hypothesize that the more committed an individual is to the organization, the more he/she will be committed to continuous improvement.

Several issues need to be addressed in relation to commitment to improvement. First, what does the concept mean? How can it be operationalized? Second, what are the antecedents of commitment to improvement? Does TQM significantly affect commitment to improvement? Is commitment to improvement the same as intrinsic motivation?

Two opposing views are briefly presented concerning the nature of intrinsic motivation and commitment to improvement. First, one could argue that the two concepts in essence are tapping an individual's desire to do the best possible job they can. If this view is accurate, the two concepts may be used interchangeably as seems to be the case in the TQM literature with some contributors emphasizing continuous improvement and others intrinsic motivation. However, a contrary view is hinted at by Lawler (1994) who argues, in the context of employee involvement, that, employees have the responsibility of calling attention to problems that prevent them from doing a quality job thus preventing them from being intrinsically motivated; they also have the responsibility of accepting a continuous improvement culture. The conceptual

similarity of intrinsic motivation and commitment to improvement is discussed and empirically tested in this thesis.

1.4.4 Change

The previous discussion highlighted the lack of explicit theories underlying the key elements of TQM. This section builds on this by looking at how an organization achieves team orientation and commitment to improvement. In other words, what is the approach to change underlying TQM? If one accepts that these attitudes or values are consistent with a total quality culture, how is culture affected?

Putting aside the debate on whether or not culture can be managed (Ogbonna, 1992-1993, Williams et al., 1993), given that culture is central to TQM, what are prescribed as the mechanisms to achieve a "total quality culture?" How does change occur within organizations? Hill (1991b) argues that the quality proponents rely on training, education and leadership as the means to affect culture. This is viewed as adequate to create the appropriate culture. Hill (1991b) argues that attention should be directed to the work of organizational behaviour academics in the area of culture. In specific terms, Schein (1985) presents primary and secondary levers to change culture. Consistent with the quality proponents, leadership and education are included. However, Schein (1985) argues for the deployment of organizational rewards and punishments as a primary mechanism for affecting culture. The use of rewards and sanctions goes against the philosophy of TQM. However, they may be necessary to show that TQM is taken seriously and to induce behaviour change in the initial instance. The rationale provided by the quality proponents is that rewards and sanctions produce compliance and not commitment.

In terms of organizational change, TQM relies primarily on normative-reeducative and empirical-rational strategies (Chin and Benne, 1976) to affect commitment to core values and attitudes of TQM. Implicit is the assumption that a change in attitudes and values will facilitate a change in behaviour. However, serious doubt has been raised about the effectiveness of this approach (Guest, 1984). The causal path between attitudes and behaviour may be more complicated. Rather than a unidirectional link, it may be a relationship of mutual influence. As such, changes in behaviour may facilitate attitudinal change.

Wilkinson (1994) argues that an organization's existing culture may inhibit the implementation of TQM. This view is also voiced by Snape et al. (1995) in that an existing culture may be a source of resistance and act as a barrier to the successful implementation of TQM. An existing organizational culture may not be the sole reason for ineffective change efforts. One factor that may contribute to the ineffectiveness of change may be a lack of readiness for change. This notion of readiness is similar to Lewin's (1951) concept of unfreezing and reflects organizational members' beliefs and attitudes concerning the need for change and the organization's capacity to implement the changes (Armenakis et al., 1993). The importance of readiness is supported by Schein's (1979) argument, *"...the reason so many change efforts run into resistance or outright failure is usually directly traceable to their not providing for an effective unfreezing process before attempting a change induction"* (p 144). The role of a need for change is underplayed in the TQM literature and this may help explain why TQM initiatives may not succeed in affecting change.

In addition to acting as a source of resistance, an organization's culture may influence how an organization interprets TQM and consequently the practices that are adopted. In simple terms, a bureaucratic oriented organization may be more inclined to interpret

and view TQM in a mechanistic way. Particular emphasis may be given to implementing (as a starting point) TQM as a set of techniques to improve organizational efficiency.

Champions of the TQM approach adopt an evangelical stance in terms of employees embracing the values of TQM with blinding faith. Based on this view, employees will view TQM in a positive light and consequently adopt the appropriate attitudes. The rationale is that TQM brings benefits in terms of: a repudiation of scientific management, employee empowerment, involvement and participation. Do employees see TQM as beneficial? Some employees may interpret TQM as increasing responsibility, stress and work intensification without a parallel increase in pay. Boje and Winsor (1993) argue that TQM is a sophisticated repackaging of Scientific Management. Employee suggestions for improvement are interpreted as a mechanism in which individuals "taylorise" their own work. In addition, rather than relying on hierarchical control, the notion of teamwork allows control to be exercised by peers whereby group deviants are compelled to conform. Therefore, the key argument is that in TQM, instead of relying on management to "taylorise" work, employees are empowered to self-taylorise their own work.

Kerfoot and Knights (1995) assert that the quality literature neglects to consider that TQM interventions may be interpreted differentially by employees. Thus, individuals may differ in terms of how they perceive the intervention. Some individuals may see it as more beneficial than others. Empirical research on organizational commitment suggests that affective attachment to the organization would positively colour an individual's assessment of organizational actions and activities (Eisenberger et al., 1990). This would indicate that the commitment of individuals to the organization are likely to predispose them to viewing the intervention in a more or less positive manner.

How individuals perceive a TQM intervention may affect the degree to which they adopt attitudes and behaviour consistent with TQM. Recent evidence suggests that it is not employee participation per se that has a significant effect on quality consciousness but rather employees' experience of their participation (Peccei and Wood, 1994; Wood and Peccei, 1995). If this holds true, attention may need to be diverted away from eliciting employee participation using whatever means to ensuring that the intervention is seen as providing some benefit to employees.

A review of the theory on TQM raises more questions that it provides explanations. This lack of theory has implications for evaluating TQM interventions; there is very little by way of guidelines as to how and why such interventions affect the key elements of TQM Consequently, any evaluation of a TQM intervention would have to begin with a theoretical development of models that help explain core phenomena such as teamwork and continuous improvement.

1.5 Empirical research

Research in TQM thus far can be broadly classified as organizational level surveys and qualitative case studies. The driving force behind the former type of research is an assessment of the impact of TQM interventions. The most prominent large scale survey into TQM practices is the series of surveys conducted by the Center for Effective Organizations at the University of Southern California[9]. The following

[9] Three surveys (1987, 1990, 1993) were administered to 1000 top Fortune organizations. The initial focus of the research was approaches to employee involvement which was subsequently modified to include TQM practices reflecting its growing importance.

discussion focuses on the results of the latest survey (Mohrman et al., 1995) which primarily examined TQM practices and their effect.

The results of the survey indicate that a high percentage of organizations (73%) are implementing TQM, covering on average 50% of employees and more prevalent in manufacturing than service organizations. Overall, TQM experience has been positive and beneficial in terms of productivity, competitiveness, profitability in addition to employee satisfaction. Thus, it would seem that all stakeholders are benefiting from the adoption of TQM. While the study represents the most extensive examination of TQM practices in the U.S, the findings are subject to the limitations of cross sectional research. In addition, there are risks in relying on a single perception or viewpoint as representing the organization's activities and adoption of TQM practices. Nonetheless, the research provides an overall picture of TQM adoption in the U.S.

An equally extensive survey has not been conducted in the UK. However, a number of large studies have examined the impact of TQM (for a useful summary, see Hill and Wilkinson, 1995). In contrast to the positive portrayal of the U.S experience, the evidence in the UK suggests that TQM has fallen short in its delivery of benefits. This may be due to the paucity of organizations with "full blown" TQM and the extensive adoption of TQM in a less than total orientation (Wilkinson et al., 1992, 1993; Cruise O' Brien and Voss, 1992). Kearney (1992) found that 80% of organizations surveyed reported that TQM initiatives failed to produce any tangible benefits. Similarly, Wilkinson et al. (1993) found that only 8% of a large sample of managers in the UK claimed that quality management was successful. How can these rather negative findings be interpreted? Are the results due to the piecemeal adoption of certain TQM practices that lack coherence or integration? Is it that adequate time has not lapsed in order that TQM can fully develop? Is it the search for quick results stimulated by

promises from consultants (Hill and Wilkinson, 1995) that when they are not achieved result in disillusionment with TQM?

Overall, these organizational level surveys are useful in providing an overall picture in relation to the adoption of TQM practices and their impact. This type of research needs to be complemented with case studies that provide greater detail and are more analytical in orientation. The empirical findings of a number of case studies are now briefly discussed.

The initial focus of case studies was on TQM in practice; how organizations implemented TQM (Hill, 1991b; Wilkinson et al., 1990; 1991). Subsequent case studies examined specific issues or aspects of TQM. McArdle et al. (1995) explore issues such as empowerment and involvement in the context of TQM. The results suggest that empowerment did not occur in terms of extending employees' rights, rather work intensification in conjunction with greater monitoring and control of work occurred. Webb (1995) concentrates on the role of management in TQM. Her case studies suggest that TQM has radical implications for managerial and technical roles. More recently, the relationship between HRM and TQM has been receiving increased attention (Snape et al., 1995; Wilkinson, 1994) and Simmons et al. (1995) provide case study evidence exploring the successes and problems encountered in one organization in employing strategic HRM to pursue TQM.

The case studies conducted to date have primarily adopted a qualitative approach and have a tendency toward ex post facto analysis of the effects resulting from the implementation of TQM. More importantly, there is a noticeable absence of longitudinal studies aimed at systematically evaluating TQM interventions. However, exceptions do exist. As previously mentioned, one study investigating the impact of a

TQM intervention on quality consciousness found that it was not employee participation per se that had an impact but rather how employees assessed and judged the intervention (Peccei and Wood, 1994; Wood and Peccei, 1995). Guest and Peccei (1994) found that a quality improvement intervention did not have a significant effect on organizational commitment.

1.6 Research objectives

This chapter has reviewed the literature on TQM with particular emphasis on what have been heralded as some of the important elements of TQM. Two issues emerged from this review. First, there is little theory underpinning the elements of TQM. Second, there has been little systematic investigation into the effects of TQM on some of these elements.

In view of the relatively early stage of theoretical development and a lag in empirical investigation in TQM, potential research questions abound. The core research question of this thesis is: does TQM affect teamwork and continuous improvement?

As mentioned in the opening of this chapter, the starting point in this evaluation is the theoretical development and subsequent testing of models containing hypothesized antecedents of teamwork and commitment to improvement. The examination of the antecedents of teamwork and continuous improvement as the first stage in this evaluation is important for both theoretical and methodological reasons. First, the development and testing of 'antecedent' models goes some way towards developing explicit theories and supplementing the theoretical basis underlying TQM. Second, from a methodological stance, it is important to control for other effects that may have

an impact on teamwork and continuous improvement. In particular, the effects of the hypothesized antecedents need to be controlled for in order to rigorously determine the direct effects of TQM.

Finally, we do not know, from existing research, whether TQM directly affects teamwork and continuous improvement or whether it has an indirect effect (in addition to or instead of a direct effect) on the two elements through affecting their antecedents. Therefore, the antecedents provide a way to capture some of the indirect effects of TQM on teamwork and continuous improvement. This is particularly important given that few evaluations have been conducted and consequently, there is a lack of knowledge as to how TQM affects the presumed outcomes.

TQM can be thought of as having two dimensions: employee participation in and assessment of TQM. The first dimension captures a behavioural component of TQM while the latter taps an affective component; how employees judge and assess TQM. Therefore, the core research question examines the effect, if any, of individuals' participation in and assessment of TQM on teamwork and continuous improvement.

In order to provide a greater understanding of the potential impact of TQM, it is necessary to ask what factors, if any, may affect an individual's participation in and assessment of TQM. While this question is not evaluation driven per se, it is important in light of the organizationwide emphasis of TQM and its reliance on voluntary participation at the employee level.

1.7 Structure of the thesis

This chapter presented a critical overview of the TQM literature and outlined the research questions (these are discussed in greater detail in chapter 3). The subsequent two chapters deal with; the context in which this research was undertaken, the content of the TQM intervention and the process of implementation (chapter 2); the approach taken to the gathering of data and the logic underlying this evaluation (chapter 3). Together, these initial chapters set the scene and provide the basis for presenting the results.

Chapter 4 examines the antecedents of team orientation prior to investigating the impact of the intervention on team orientation in chapter 5. As a precursor to examining the impact of the intervention on commitment to improvement (chapter 7), chapter 6 examines the conceptual similarity of commitment to improvement and intrinsic motivation. Chapters 8 and 9 investigate the predictors, if any, of employee participation in and assessment of the TQM intervention.

The common element of the results chapters thus far is that they focus exclusively on employees. Consequently, chapter 10 examines change, if any, in supervisory behaviour and the predictors of two key dimensions of behaviour; participative style and commitment to quality. Chapter 11 integrates the findings by making an overall assessment of the intervention using a number of different criteria. The subsequent and final chapter draws the conclusions and suggests directions for future research.

Chapter 2: The Context

2.1 Introduction

Having raised the research questions in the previous chapter, this chapter presents a descriptive account of the organizational context, the content of the TQM intervention and the process of implementation. The subsequent chapter builds on this by presenting a detailed overview of the research methodology employed in this study. Together, these two chapters bridge the research questions posed and the empirical findings.

Providing an account of the organizational context and the TQM intervention is important for a number of reasons. First, and foremost, as a consequence of the lack of conceptual clarity of TQM, TQM interventions may take on a variety of forms that could be expected to lead to different outcomes. Second, the content of the intervention and the context in which it occurs may assist in the interpretation of the results and also have policy implications for organizations implementing TQM interventions. Finally, the content of the intervention may be a key explanatory factor in comparing the outcomes of TQM interventions in different organizations.

The initial objective of this research was to compare two sites within the same organization that differed in terms of their progress in implementing TQM. Consequently, a site was selected that was about to embark upon a TQM intervention and as a contrast, a site was chosen that had progressed considerably in terms of implementing TQM. While the two sites were subject to the same organizationwide reorganization of manufacturing operations and changes in employee practices and policies (this is discussed in detail later), there was an interesting difference in terms of

the emphasis given to the so called 'hard' and 'soft' dimensions of TQM. The site embarking upon the TQM intervention emhasized the cultural dimension while the other site, although espousing the importance of attitudes and values, placed greater emphasis on the systems associated with TQM. Due to unforeseen circumstances which are briefly described in the subsequent chapter, it was not possible to include the second site in this manner in this study.

This chapter begins by describing the overall organization and the site implementing a TQM intervention. This is followed by a brief historical portrayal of the changes that occurred prior to the TQM intervention. Subsequently, the rationale for embarking upon the intervention is presented. Following from this, the content of the intervention and its process of implementation (for the duration of this study) is reviewed.

2.2 The Organization

The organization is a UK based multinational supplier of engineering and electrical components. Within the UK automotive industry, the organization dominated the vehicle components market in the 1960s. Its dominant position remained during the 1970s and 1980s although the absolute size of the market shrank catastrophically. The most profitable aspects of the business were the overseas operations while the automotive components side incurred a loss for the first time in 1981 in over a century of trading. In response to this, operations were streamlined, sites were closed and amalgamated and the labour force was reduced. The reduction in the work force was an immediate response to the falling demand but also provided the foundation for subsequent changes geared towards improving labour productivity.

Thus, the operating sites within the automotive components side of the organization, as a precursor to a major reorganization of production, adopted new technology, a tough 'take it or leave it' approach to pay negotiations, a shedding of the work force and the introduction of minor changes to work practices. Together these changes provided the basis for the introduction of a new 'Japanese style' manufacturing method as part of the Survival Plan of the mid 1980s. The story is now picked up by focusing on the site in this study.

2.2.1 The Site

The site was one of 34 production units of the company in the UK employing 1,100 in the early 1980s.[1] In a personal message to all employees in 1985, the General Manager of the site stated *"despite the strenuous actions on part of all employees over the past few years we are still trading at a loss and, unless this situation is remedied, we must eventually go out of business"* (internal documentation). The major reason for the continuing losses of the site was a dramatic decline in the market for heavy duty electrical components against a background of increased competition. In the previous five years, the UK market for heavy duty electrical equipment fell by 48%. This was a direct result of a reduction in the UK bus and truck production. While the size of the market shrank, the site was able to increase its market share at the expense of competitors.

In order to reverse the operating losses, fundamental changes were needed. Labour costs were 50% of total outgoings so a reduction in the labour force was on the cards.[2] In addition, the remaining objectives included the production of the highest quality and

[1] The number of production units in the UK is currently approximately 27.
[2] In the previous decade, the work force had been reduced from 2,300 to 1,100.

most reliable equipment, and a reduction in the response time to fulfilling customer requirements.

2.2.2 Major changes at the site

The new way forward for the site was the introduction of a new manufacturing technology. The site was not the first within the overall organization to introduce modular manufacturing systems. It was adopted as an organizationwide move toward more flexible manufacturing systems. Module production (originating from the 'kanban' system in Japan) is a method akin to 'just-in-time' production where stocks and work in progress are aligned to fit the production schedule. The system has been described as mini factories within the factory (Turnbull, 1986).

After a pilot scheme, the modular system was introduced throughout the site in 1988. Each module could be described as a mini business producing a single product or a single group of products. All the manufacturing processes associated with that product were placed within the module and also, other activities which were necessary to the module were designed to give maximum support. This involved the transfer of activities traditionally carried out by indirect support departments to the module itself. For example, rather than having a centralised buying or purchasing department, this function was devolved and integrated into the module as one of its activities. However, activities such as personnel and management services remained centralised. Depending on the number of products manufactured within the module, the module may have been divided into a number of cells corresponding to each product or component. This cell based structure, otherwise known as teamworking, became the building block of the new system and represented a radical departure from previous production methods.

A key feature of the new system was that personnel within the cell or module worked as a team. In some cases, this required a wider range of skills from employees. All employees were required to be willing to do whatever they could (taking into account their training and capabilities) to keep their cell or module operating. The aim was to have as much flexibility within the cell or module as possible. In practice (among other things), craftsmen and operators were trained to set up and operate respectively as many different machines as the cell or module required to manufacture their component or product. One of the major consequences of this new system was a significant reduction in the number employed. Inherent in the operation of the new system was flexibility not only in technology but also in personnel. What emerged was the disappearance of demarcation, the breeding of 'super craftsmen' and the upgrading of operator skills.

In terms of organizational structure, there was a flattening of the hierarchy. The management structure was reduced from a seven tier to a five tier structure. Classification of direct production employees was reduced from seventeen to two. Thus, after the manufacturing reorganization, production employees were either craftsmen or operators. Through a combination of redundancies and retraining for new jobs, the number employed at the site was reduced by 50% (from 1,100 to approximately 580) by the late 1980s.

In parallel to the manufacturing reorganization, changes in terms and conditions of employment were introduced. Specifically, this involved the creation of single status employment with no difference in conditions and benefits between staff and works employees. Methods of payment and pension scheme were harmonised. Pay grades for the shop floor were reduced from 59 to 8 and a simplified payment for skills was introduced.

By 1990, the site had transformed the loss making situation to one of profitability. The product range was streamlined from 121 product types to 66. Responses to customer needs were reduced from on average three months to 1-6 weeks. Overall, the results of the manufacturing redesign meant that the site could match its competition on quality and delivery. From this point, the main strategic objective was to focus on a narrower product range and to target European vehicle manufacturers for growth. Further changes were introduced to include continuing education and training schemes and an open learning centre. This reinforced the notion of continuous improvement to ensure the survival of the site. In conjunction with healthcare, these changes signalled a willingness to invest in employees in order that they may reach their potential which would benefit the site. A comprehensive communications programme was launched which served (among other things) to bring what was happening in the market place to the door of the manufacturing cells and modules reinforcing the business focus of the new manufacturing system.

Compelled to build on the momentum of previous changes, the site in early 1991 launched Continuous Improvement Groups (similar to the widely known Quality Circles) as a means of continuing the improvements already achieved. From discussions with management and employees, the general view was that this initiative was doomed to failure from the start for a number of reasons. The main managerial objective in introducing Continuous Improvement Groups was to provide a mechanism for employee contribution to efficiency and quality objectives. These groups never gained a strong foothold at the site. From management's view, participation was voluntary and there was a lack of employee willingness to participate. Some employees felt that they had contributed to the site by accepting the reorganization of production and were unwilling to voluntarily participate in further change. Probably, the primary reason for the failure of these groups was a lack of visible support from managers and

supervisors. Aside from the perceived lack of importance attached to these groups, they were interpreted as an add on activity rather than integrated into the normal activities of the site. At this stage, the site was now making a profit which consequently did not help in creating at supervisory or employee levels a perceived need to change. Overall, the take up of these groups was sporadic with some groups disbanding while others started.

By the spring of 1992, twenty or so employees were participating in these groups which were slowly fizzling out. In fact, some employees were unsure if their Continuous Improvement Group was still in operation. Overall, the experience and failure of these groups prompted a more serious organizationwide endeavour into TQM. Against the background of the major manufacturing reorganization and the failure of Continuous Improvement Groups, the site embarked upon a TQM intervention under the title of 'Working Together to Win' (WTTW). The remainder of this chapter concentrates on the content and process of this intervention. However, as a prelude, the thinking and intentions behind the intervention are discussed.

2.3 Rationale behind WTTW

Overall, the intervention was seen by the executive management team at the site as a natural progression of previous changes. Furthermore, while the prior changes primarily focused on the hard visible reorganization of manufacturing, it was felt that the culture of the site lagged behind in terms of progress. Consequently, in order to guarantee the survival of the site and to ensure its continued profitability, the key was to change the culture of the site. While this was not the objective of the Continuous Improvement Groups, the lessons learned from this experience were twofold: the change needed to occur throughout the site and it must start from the top. This type of

transition from Continuous Improvement Groups or a similar grassroots improvement structure to TQM is not uncommon. Hill (1991b) found that in the initial instance, some organizations experimented with Quality Circles prior to implementing TQM. Even though the foray at the site with Continuous Improvement Groups was far from successful, it signalled the potential value of employee involvement in continuous improvement and thus the way forward.

The intervention was perceived as a natural progression of the previous changes in work methods, systems and structure. The view of TQM as a philosophy or culture was a key factor in the design of the intervention. The objective was continuous improvement and this was to be achieved by the participative involvement of everyone. Therefore, continuous improvement and continuous change were seen as providing the key to the future of the site. This relied on people changing their attitudes toward continuous improvement; viewing continuous improvement as an integral part of their job.

By late spring of 1992, the executive team had enlisted the help of a Total Quality expert from within the organization. This individual had considerable knowledge of the site and viewed TQM more in terms of attitudes and values rather than systems and techniques. The role assigned to this individual was to act as a bridge between the executive team and the group of outside consultants that would design and implement a 'soft' TQM intervention. Shortly thereafter, while the forthcoming TQM intervention was in the early planning stages, the baseline questionnaire was completed by the participants in this study. With the exception of the executive team, no-one at the site was aware or had knowledge of the forthcoming intervention.

Considerable time and energy was given to the design of the intervention; the content of the training programme and its subsequent implementation. The overriding objective of the intervention was cultural change aimed at continuous improvement through the vehicle of 'participative involvement'.

2.4 The TQM intervention

What constitutes a TQM intervention? How does the intervention at this site compare to other interventions? This raises a broader issue of what changes are part of and what changes remain outside TQM. Hill and Wilkinson (1995) argue that among other contingent factors, TQM may manifest itself differently depending on the stage of quality development. Reflecting different views of TQM, what may be considered part of a TQM intervention in one organization may be viewed as the opposite in another organization. To illustrate this point, McArdle et al. (1995) report from their case study that while TQM was introduced in 1986, harmonization of benefits and conditions did not occur until 1988 and appears to be part of the TQM philosophy. In this study, harmonization occurred in parallel to the manufacturing reorganization which paved the way for TQM. The first venture into "TQM" at this site (as the case with a number of other organizations, see Hill, 1991b; Rees, 1995) was through Continuous Improvement Groups.

While the restructuring of work along cellular lines at the site is consistent with TQM, it did not occur as part of TQM but rather as part of an organizationwide move to restructure the manufacturing basis of its operations. McArdle et al. (1995) found that *"at the operator level the main changes which were introduced into the operation were as much a part of the changes in the manufacturing systems as to do with the TQM system"* (p162). What this illustrates is the difficulty in disentangling the effects of

TQM and the ambiguity surrounding what is part of a TQM package. Most of the empirical work on TQM takes the form of retrospective case studies spanning years rather than real time monitoring of the implementation of TQM. Consequently, this has implications for analysing what is introduced as part of TQM and what is introduced as part of other changes.

Jenkins et al. (1995) in their case study of TQM in Royal Mail noted that a TQM programme was embarked upon in 1988 while a business reorganization which included delayering and resulted in voluntary redundancies occurred in 1992. Thus, the softer dimension of creating a climate for continuous improvement was a precursor to the hard structural reorganization. In essence, the sequence of changes occurred in the opposite direction to the changes in this study.

Returning to the issue of what a TQM intervention involves, it may be beneficial to classify types of interventions akin to the classification of HRM strategies. Wilkinson (1992) interprets the 'hard' side of TQM to comprise the tools and techniques of TQM while the 'soft' side as creating customer awareness through educative means. This type of broad categorization could be applied to TQM interventions so that the emphasis could be more clearly marked. Thus, the 'hard' dimension may include the production tools and techniques of TQM, structural reorganization and quality infrastructure necessary for continuous improvement. In contrast, the 'soft' component of TQM may be more concerned with instilling the values and attitudes of a total quality culture. There is a danger in attempting to classify interventions as one or the other thus viewing the two dimensions as distinct. In reality, many interventions include elements of both and as the previous chapter suggested the principles of TQM may have a 'hard' and 'soft' component relating to a system and cultural dimension.

Although crude, the above classification of TQM interventions, helps to highlight where the emphasis of TQM interventions lie. In this study, the emphasis was clearly on changing the attitudes and values and on the creation of a total quality culture. As such, the objective of the intervention was similar to Xerox's leadership through Quality process *"aimed at fundamentally changing the way Xerox people work and manage so they can continuously improve the way they meet the requirements of their customers"* (Ross, 1994, p53).

In attempting to create an involvement culture, the training and education covered such issues as Theory X and Y, leadership styles and empowerment. Specifically, the focus was on changing managerial assumptions which in turn would lead to behaviour change thus influencing the behaviour of those in subordinate positions. Therefore, the primary vehicle for achieving culture change at the site was through changing the attitudes and behaviour of those in supervisory positions. This thinking is consistent with that in the TQM literature whereby managers are the initial target group for change and change at this level is a necessary prerequisite for successful TQM efforts (Hill, 1991b).

A second focus of the education and training was on leading and managing groups. This entailed team building exercises, techniques for effective team meetings and problem solving techniques. An extension of this was work improvement through leaders facilitating employee involvement in the improvement process. Continuous improvement is the job of all employees who can contribute to small scale improvements known as 'kaizen'. Naturally occurring work groups can also contribute to 'kaizen' but in addition to cross functional teams may make breakthroughs in terms of major improvements.

The traditional TQM tools and techniques included the Deming Cycle, Quality Grid, Cost of Quality, Customer- Supplier process, Brainstorming, Fishbone Diagrams and Force Field Analysis. These tools were included as guides to achieving work improvements. Finally, structuring expectations, measuring performance and participative objective setting were included. The training and education programme was aimed at kick starting the culture change at the site.

The education and training programme was perceived to be a sufficient stimulus and inducement for culture change at the site. In theory, supervisors who completed this programme would reproduce the training for their subordinates. Following from this, a WTTW team would be set up in that particular work area which would give employees a vehicle for greater say in what happens in their area, provide a mechanism for work improvements stimulated by the internal customer-supplier audit completed periodically with the internal customers of the work area. Furthermore, it would provide a forum whereby problems individuals faced in doing their work could be eliminated and suggestions for improvements could be implemented.

Therefore, it was assumed that as a result of the training programme, a series of subsequent changes would occur throughout the site. The programme would provide a common objective between managers and employees, departments and work areas and a common 'language' thus providing the foundation for continuous improvement. In addition, an underlying assumption (also visible in the TQM literature) was that education, training and leadership were sufficiently strong tools to affect change.

2.5 The process of implementation

The starting point was the training and education programme which the outside consultants ran off site for the General Manager and his executive management team. Subsequently, a group of internally selected facilitators were taken off site and undertook a facilitation workshop in addition to attending the training and education programme. This group of facilitators with the assistance of the outside consultants were given the task and considerable autonomy in selecting the process by which this training and education was cascaded down the organization. Toward the end of 1992, the General Manager, the executive team and the facilitators had completed the programme. A steering committee was set up consisting of an equal number of facilitators and members from the executive team whose task was to launch and oversee the 'Working Together to Win' intervention.

The intervention itself was launched in a blaze of publicity in January 1993. To stimulate interest, a variety of poster and publicity campaigns were launched. The objectives of the intervention were communicated to the union representatives and the entire work force. The group of facilitators ran the training and education programme throughout the managerial/supervisory hierarchy with one day follow up work shops. These managers and supervisors were then responsible for training their subordinates. This cascading of the training process is similar to that conducted at Xerox whereby training began at the top of the organization and a manger, once trained, was responsible for training his/her immediate subordinates (Ross, 1994).

By the end of March 1993, all managers and supervisors had completed the programme. It was now up to the individual managers to train their direct subordinates and involve them in the intervention. Overall, the feedback given to the internal

facilitators on the programme was generally positive. The role of the facilitators and steering committee was to guide and oversee first the cascading of the training and second the formation of teams. Regarding the latter, a manager and his/her subordinates, in theory, would set up a WTTW team in which a facilitator would be present to assist in the process of objective setting, developing action plans and so forth. The subordinates, if they were supervisors, would subsequently set up their own teams in their work area. Thus, there would be a 'linking pin' between different hierarchical teams facilitating the implementation of improvements. For example, a manager would participate in a team (cross functional or with his/her superiors) which may suggest that certain improvements be made in a manager's work area. These suggestions would be subsequently taken to the manager's own team (in his/her work area) for discussion and subsequent implementation.

It was assumed that after completing the programme, managers and supervisors would actively cascade the training and set up teams. In practice, some managers did while others did not. Some speculations can be offered as to why there was 'resistance' by some individuals in supervisory positions to training their subordinates and involving them in the intervention. First, a number of individuals in question (prior to the reorganization of production) were foremen. Thus, while their job title and job content had changed, their attitude to their job as one of directing and controlling may have remained unchanged. The tenets of the intervention with particular reference to managing styles may have been perceived as undermining their authority and responsibility. Second, it is possible that the perceived demands of the job constrained the extent to which managers could cascade the intervention. The resistance by a number of managers was underestimated and consequently there was no pre planned strategy for dealing with it. This lack of commitment on the part of some managers resulted in a very uneven cascading process. By the time of the second round

questionnaire in September/October 1993, in some areas, the training had not only cascaded to the bottom of the organization but also teams had been set up. In contrast, in other areas, employees were still in the dark regarding the intervention apart from the information that had been communicated to them when the intervention was launched nine months previously.

The steering committee decided that in dealing with the reluctant mangers, they would launch a 'kick start' meeting. This involved each manager presenting to the steering committee the progress they had made in cascading the training and involving subordinates in the intervention. This was viewed as a way to induce change by applying pressure to these managers for action. For some individual managers, this had some effect. While it did not lead to wholehearted enthusiasm and commitment, they did make some progress. For the core resistors, this proved ineffective in stimulating change.

In the autumn of 1993, in view of the pockets of resistance at managerial levels, it was decided that progress in the intervention was to become an integral part of each manager's annual performance objectives and thus part of their performance appraisal. Despite the attempts of one union to bring the intervention into the annual pay negotiations, in keeping with the traditional TQM philosophy, there was no financial incentive offered to employees for their participation. After some debate, the steering committee decided against compulsory participation at employee levels. However, all new employees, would be required as part of their job to participate in the intervention.[3]

[3] During 1994, the site took over the manufacturing of a new product from a different site and consequently hired a new group of employees (approximately 70). This new group of employees were informed of the intervention and a condition of their employment at the site was their participation in the intervention.

This study was conducted early in the change process and consequently captured the uneven cascading of the intervention. Around the time of the second round of data collection for this research, there was a noticeable attempt on directly targeting managerial behaviour as a means to ensure that the intervention was cascaded throughout the site. Furthermore, this shift to focusing on behaviour continued with new employees (as mentioned above) joining the site being required to participate in the intervention.

2.6 Summary

This chapter provided a descriptive account of the organizational context in which this study took place. This involved providing an historical portrayal of the changes that occurred at the site prior to the implementation of the TQM intervention. As a precursor to describing its content, the rationale given by management for implementing the intervention was presented. The final element of this chapter focused on the process of implementation.

Having provided a description of the context of this study, the subsequent chapter complements this by presenting the research methodology employed. The focus of the next chapter is on the approach taken to gathering the data and the logic underlying the evaluation of the intervention.

Chapter 3: Research Methodology

3.1 Introduction

The opening chapter provided a summary and critique of the literature thereby highlighting the theoretical and empirical gaps to date in TQM. From this, the chapter raised a number of research questions that the thesis sets out to address. Building upon the descriptive account of the site and the intervention in the previous chapter, this chapter addresses how the research questions may be answered. Given the types of research issues being examined, what is the most appropriate method of investigation?

This chapter presents a detailed overview of the research methodology employed in this study. This involves a discussion of two related issues: the approach taken to the gathering of the data and the logic underlying the evaluation of the intervention. Therefore, the aim of this chapter is to integrate the research questions, research methodology and data analysis so that the results can be presented in the subsequent chapters.

We start by re-examining in greater detail the research questions. Subsequently, in view of the paucity of evaluation studies in TQM, a number of studies evaluating other organizational change interventions are discussed with reference to the types of research methodologies adopted. Thus, given the research questions and the methodologies employed in previous evaluation oriented research, what is the ideal research methodology for this study? By outlining an ideal research design, the actual research methodology employed can be assessed against a benchmark. This will highlight the limitations of the actual research design and also assess the feasibility of

some aspects of the ideal design. The final issue that is addressed in this chapter is the statistical procedures used to analyse the data.

3.2 Research questions

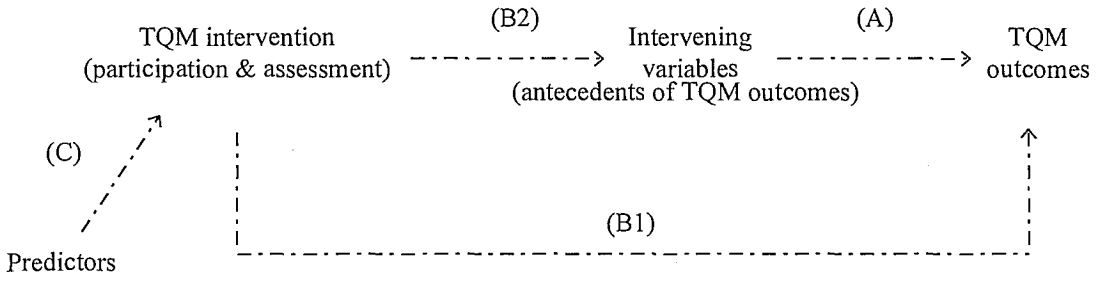
A key issue in the selection of a research design is its appropriateness in addressing research questions. Therefore, the research questions are first examined in greater detail as a basis for discussing the research methodology in the remainder of the chapter.

The previous chapter discussed the nature of possible TQM interventions and provided a descriptive account of the intervention which is the focus of this investigation. The key research question is: what is the impact, if any, of this intervention on work attitudes? As mentioned in chapter 1, this begs a further question as to how one assesses the impact of the intervention. One of the first problems faced in following a 'scientific' approach to conducting research is the derivation of hypotheses from the theory. This is particularly relevant in the case of TQM in view of the absence of explicit theories or conceptual frameworks to guide an evaluation. In chapter 1, a strong theoretical rationale was presented for examining the antecedents of teamwork and continuous improvement. Here, the emphasis shifts to the methodological reasons thereby highlighting the logic underlying this evaluation.

The research questions and thus the logic underlying the evaluation of the intervention are depicted in Figure 3.1. First, stage A, addresses the initial research question on the antecedents of the key elements of TQM in this study: teamwork and continuous improvement. Stage B1 examines the direct effects of the intervention on teamwork and continuous improvement, while stage B2 + A relates to the indirect impact of the

intervention on the two outcomes. Finally, stage C, sheds light on the third research question regarding the antecedents of participation in and assessment of the TQM intervention. The logic of this evaluation is now discussed in greater detail.

Figure 3.1: Logic underlying the evaluation of a TQM intervention



As mentioned in chapter 1, we have little knowledge of how a TQM intervention would affect the outcomes of teamwork and continuous improvement. For example, does one assume that if a TQM intervention affects continuous improvement, it will do so directly? For example, individuals who participate in the intervention will subsequently become more committed to improvement. While this indeed may be the case, it is also possible that the intervention may have an indirect effect on teamwork and continuous improvement. The intervention may affect, for example, some of the antecedents of teamwork which in turn affect teamwork. Hence, the intervention may have an impact in several ways: a direct effect, an indirect effect and a combination of both.

Therefore, this evaluation examines the total (direct and indirect) impact of the intervention on teamwork and continuous improvement. The direct effects of the intervention are examined in Stage B1 depicted in Figure 3.1. In assessing the direct effects of the intervention on the outcomes, it is important to control for other potential effects. Hence, in examining the direct effects of the intervention on teamwork, for example, the effects of the hypothesized antecedents of teamwork are controlled for.

Here, the hypothesized antecedents take on the role of control variables. This permits a more rigorous determination of the direct effects of the intervention on the two outcomes.

The indirect effects of the intervention are examined by looking at the effects of the intervention on the antecedents (B2) which in turn affect the outcome (A). Here, the antecedents provide a way to capture some of the indirect effects of the intervention on teamwork and continuous improvement. An example of an indirect effect may be that the intervention has an impact on an employee's perception of their supervisor's commitment to improvement which subsequently has an effect on an employee's own commitment to improvement. This does not preclude the intervention also having a direct effect on an employee's commitment to improvement via their own participation in the intervention.

Therefore, the logic underlying this evaluation is that the total impact of the intervention must be assessed. The rationale for assessing both the direct and indirect effects of the intervention on outcome(s) is twofold. First, relying on either the direct and indirect effects alone as a basis for evaluation may lead to an incorrect conclusion. Had Peccei and Wood (1994, and Wood and Peccei, 1995) in their study focused exclusively on the direct effects of the TQM intervention on quality consciousness as a basis for their evaluation, they would have concluded that the intervention did not have a significant effect. Rather, in using both the direct and indirect effects, the authors concluded that the TQM intervention did indeed have a significant total effect on quality consciousness. This approach has been previously used to examine, for example, the total impact of a range of antecedents on innovative behaviour (Scott and Bruce, 1994), absenteeism (Deery et al., 1995), and the impact of two different interventions on organizational commitment (Guest and Peccei, 1994).

The second rationale for including both direct and indirect effects as a basis for evaluation is to capture the unintended consequences of the intervention. This is particularly relevant to evaluations of TQM interventions given that few have been conducted and consequently, there is a lack of knowledge as to extent of its impact as well as the mechanisms by which it has an impact.

To summarise, in order to evaluate the impact of the TQM intervention on teamwork and continuous improvement, the first research question asks what are the antecedents of teamwork and continuous improvement? This provides a basis for addressing the second research question: what is the total impact of the intervention on teamwork and continuous improvement?

In examining the effects of the intervention, we are interested in the effects of individuals' participation in and assessment of the intervention. Therefore, a more accurate reflection of the research question is: what is the total impact of individuals' participation in and assessment of the intervention on teamwork and continuous improvement? Underlying this are two further questions. First, is participation in the intervention a sufficient condition for affecting change in teamwork and continuous improvement? And comparatively, how important is an individual's assessment or judgement of the intervention in affecting change in teamwork and continuous improvement?

To the extent that participation in and assessment of the intervention has an impact on teamwork and continuous improvement, what factors may affect an individual's participation in and assessment of the intervention? While this question is not evaluation driven per se, it needs to be addressed in order to provide a more complete

picture of the potential impact of the TQM intervention. As a change intervention, TQM is organizationwide and in theory, relies on voluntary participation from employees. Given that some employees may choose not to participate and that employees may differ in how they assess the intervention, this has a potentially strong effect on the outcomes of the intervention. In addition, this question has policy implications for organizations embarking on TQM.

In summary, the thesis addresses three questions. First, what are the antecedents of teamwork and continuous improvement? What is the total impact of individuals' participation in and assessment of the intervention on teamwork and continuous improvement? Finally, what factors affect an individual's participation in and assessment of the intervention?

Having outlined the three research questions, the logical next step that warrants attention is the research method by which these questions can be appropriately answered. Does the existing research on TQM offer any insights as to an appropriate methodology? What types of research designs have been employed to evaluate other organizational change interventions? How appropriate and feasible are they for addressing the present research questions?

3.3 Research approaches: choice?

What is the most appropriate research design to adopt given the nature of the research questions posed? The majority of the research investigating TQM in organizations has adopted a case study approach which has tended toward ex post facto analysis. As mentioned in the opening chapter, there is a scarcity of evaluation driven research in TQM (exceptions would include Guest and Peccei, 1994; Peccei and Wood, 1994;

Wood and Peccei, 1995) and the research questions of interest here are novel in the sense that they have not received systematic attention to date.

Before reviewing the more common research designs employed in evaluation studies, it is important to present a rationale for rejecting other research designs. The use of a qualitative research approach does not facilitate the empirical testing of theoretically constructed models as it emphasizes the subjects' interpretations or understandings of social reality. This does not preclude the use of qualitative methods as a precursor to, for example, the design of a questionnaire. Overall, a primarily qualitatively driven research design may be more appropriate to investigating individuals' interpretation of what TQM is, the reasoning behind their thinking on TQM and the importance they attach to TQM within the context of their role or job in an organization. This qualitative approach is quite prominent in examining a variety of issues relating to TQM (see for example, McArdle et al., 1995; Rees, 1995; Dawson, 1995; Wilkinson et al., 1991).

A common approach to empirically testing theoretical models is the use of a quantitative approach consisting of a questionnaire. Of central importance is how the questionnaire is utilized. The causality problem of cross sectional surveys has been well documented (Bryman, 1989). In this study, the ability to attribute cause and effect goes to the core of the research questions. A questionnaire at a single juncture would not provide a strong basis, for example, for ascertaining the antecedents (causes) of employee assessment of a TQM intervention (effect). Pursuing this, if organizational commitment was found to be related to the assessment of the intervention, what is the direction of influence? Organizational commitment may have an effect on assessment or assessment may subsequently affect organizational commitment. Both interpretations are equally plausible. Cross sectional data does not provide an adequate

basis for inferring causal connections unless the logic of causal order can be reconstructed. While a cross sectional questionnaire may include retrospective data, attempting to evaluate the impact of a change program using this method may be susceptible to a host of contamination effects.

Therefore, these two research approaches; a qualitative research design and a cross sectional quantitative approach, have been deemed inappropriate to address the research questions in this study. From here, the next step is to review the methodologies employed in other evaluation studies of change interventions.

3.3.1 Evaluation: organizational change interventions

Probably the most frequent research design employed to study the implications of interventions in organizations is a quasi-experimental design or a variation of this. For example, in assessing the impact of Quality Circles (QCs), a number of researchers have adopted a pretest-posttest non equivalent control group design (Griffin, 1988; Marks et al., 1986). Similarly, this type of design has been used to investigate the effects of work redesign or changes to the content of jobs (Hackman et al., 1978; Wall et al., 1986). In addition, studies examining the effects of participation in decision making have adopted a variation of the quasi-experimental research design (Coch and French, 1948; Lawler and Hackman, 1969). Guest and Peccei (1994) adopt a quasi-experimental design with multiple equivalent groups (using three treatment groups) to investigate the impact of two different interventions on organizational commitment.

Therefore, it would seem that a quasi-experimental research design is appropriate for investigating organizational change. This type of design facilitates the establishment of causality; does a particular intervention (cause) lead to certain outcomes (effect)? Two

key elements of this approach are central to the attribution of cause and effect. First, there is a longitudinal dimension; that is, measurement before and after the intervention. This permits an examination of the change that has occurred in the period between the measurements. If change has occurred, is this a result of the intervention? The second element of a quasi-experimental design; the establishment of a control group helps determine the explanation for the change. If the change is only visible in the experimental group which had the intervention and no apparent change has occurred in the control group, one is in a better position to conclude that the intervention was the cause of the change in the experimental group (assuming that the two groups were comparable on all the relevant dimensions to begin with).

3.3.2 Ideal research design

At face value, a quasi-experimental design would seem to satisfy the requirements of: (a) assessing change over time and (b) ascertaining the effect of the intervention on that change. Using this as a basis, the following are the important characteristics of an ideal research design. First, it would be necessary to examine the short and longer term effects of the intervention. This would involve several waves of post intervention measurement. The rationale for this is the view that TQM requires a longer time to show the full benefits. In addition, short term observed changes may not be mirrored in the longer term. For example, Griffin (1988) found that the positive effects of QCs were apparent in the initial period but subsequently declined in the longer term. On the contrary, Hand et al. (1973) found no significant change (in the short term) in managerial attitudes and behaviour as a result of human relations training but significant change was found in the longer term. The notion of short term and long term change is wide open to interpretation and one researcher's idea of short term is

another researcher's long term. Clearly, these time orientations must be viewed in the context of the intervention and when changes could realistically be expected to occur.

In the particular case of TQM due to its organizationwide emphasis, it would be necessary to have a control or comparison group outside the unit implementing the TQM intervention. This is to avoid contamination of the control group by what is happening elsewhere in the organization. Therefore, in ideal terms, what is necessary is a comparison group (this could be another site within the same organization) that is comparable in all important respects. In other words, the only differentiating characteristic between the two groups is that one group is implementing a TQM intervention and the other is not.

Bryman (1989) argues that a number of experimentation principles are transgressed in field experimentation due to a lack of control of the researcher over events and experimental arrangements. For example, Jenkins and Lawler (1981) in their study of a single organization (with no control group) examined the effects of a new payment scheme. Two changes were introduced: a participatively designed pay plan and a pay increase between the pre and post measurements. In this study, the introduction of more than one change rendered it difficult to disentangle the effects on the outcome. Thus, to a greater degree than the change interventions outlined earlier, the introduction of TQM may potentially involve changes to the organizational structure, and processes as well as individual attitudes and behaviour. Steel and Jennings (1992) argue that TQM interventions do not lend themselves to conventional research strategies. They highlight that one of the reasons is the multifaceted nature which makes it difficult to isolate the effects of individual changes.

Therefore, an ideal research design would have the following elements. First, a longitudinal element that captures both the short and longer term effects. Second, a control group that is unaffected by the intervention. Third, the absence of other changes that may be introduced with a TQM intervention or introduced at the same time but unconnected to the intervention. If other changes do occur, they need to be controlled for so that their effect on the outcome can be assessed. What may be perceived as minor changes such as individuals changing jobs or their supervisors changing during the implementation of the intervention may have a significant effect on the outcomes of the intervention. For example, in this study, one of the objectives of the intervention was to increase co-operative interaction between individuals in a work group (i.e. team orientation). During the course of the intervention, if an individual changed jobs and moved into a different work group, this may have an effect on their team orientation. Thus, this type of effect needs to be controlled for in examining the effect of the intervention on team orientation.

Are the characteristics of the ideal research design feasible? Pettigrew (1990) argues that in the social sciences, longitudinal research has always been in the minority. In practice, longitudinal research faces the potential unique obstacles of continued access for the required time period and also a lack of control over the events that occur in the intervening period. However, this serves to make longitudinal research more difficult rather than unfeasible. The establishment of a control group may pose a more difficult problem in the context of TQM due to its organizationwide emphasis.

Regardless of the type of intervention being examined, the establishment of a control or comparison group seems to be generally difficult to accomplish. Consequently, the absence of control groups in studies of organizational change is not unusual. Cummings, Molloy and Glen (1977) report that 23 out of the 58 work experiments

analysed did not have a control or comparison group. Obtaining an uncontaminated control group within the same organization may be difficult due to the organizationwide (or unit wide) focus of TQM. What may be even more difficult is finding a comparable organization that is similar on all the relevant variables with the exception of the TQM intervention.

Rossi and Freeman (1993) argue that the most severe restriction on the choice of research design employed to evaluate interventions is whether or not the intervention in question is being delivered to all members of the target population. The examples previously presented of quasi-experimental research designs consisted of partial coverage programs whereas in theory, TQM is a full coverage intervention. To overcome the absence of control groups in full coverage programs, two strategies may be adopted contingent upon the number of post intervention measurements. First, if the intervention progresses slowly to full coverage (thus, particularly at the early stages individuals will be differentially exposed to the intervention), repeated post intervention measurements will allow the identification of processes by which the intervention affects the individuals. If a post intervention measurement is taken only once, depending on the speed of diffusion of coverage, a post hoc control group may be a possibility. Lawler (1977) argues that in the absence of a control group, data should be gathered everywhere the change is expected to impact and if the change does not affect one area/group or if it has been less affected, a post hoc control group may be established.

3.4 Research design adopted

In many situations, it is difficult or unfeasible to conduct research using in ideal terms the best possible research design. Rossi and Freeman (1993) advocate the 'good

enough' rule in selecting research designs for evaluating change programs. Consequently, trade-offs are made in formulating the best possible design taking into account methodological issues, practicalities and overall feasibility. We now turn to the research design employed in this study.

The initial focus is on the case study approach. In particular, two elements of the research design are discussed: the longitudinal dimension and comparison group. Following from this, the research method; that is, the questionnaires are reviewed. Finally, the process of data collection from the point of entry into the organization is described.

3.4.1 Case study approach

As mentioned in the previous section, the nature of TQM does not lend itself to a quasi-experimental research design. Therefore, the research framework adopted here does not meet the criteria of a quasi-experimental research design and may be better described as a longitudinal case study.

A case study approach as defined by Yin (1984) allows a detailed investigation of a particular phenomenon within the context in which it occurs. Therefore, in this study, a case study approach permits a more in-depth examination of a TQM intervention and places it in the context in which it occurs. This approach has been put forward as one of the primary research designs in which quantitative and qualitative methods may be combined. It has been argued that it is unusual for quantitative and qualitative research methods to be allocated an equal role within the overall research design. This study is no exception in that greater emphasis was placed on quantitative methods. To a greater extent, the use of quantitative versus qualitative methods was contingent upon the stage

of the research process. For example, at the commencement stage of this study, unstructured interviews and documentation provided contextual information with regard to previous organizational changes and future expectations regarding the planned TQM intervention. Subsequently, quantitative methods came to the fore in terms of providing a baseline measure upon which to assess the extent of change. Between the collection of the baseline questionnaire and the second questionnaire (some 15 months later), interviews which were highly unstructured and quite ad hoc (particularly with employees) fulfilled two roles. First, as a way of monitoring the progress of the intervention and second, as a source of additional questions to be included in the second questionnaire.

3.4.2 Longitudinal research

From a methodological viewpoint, a longitudinal dimension is a requirement for evaluating organizational change interventions. The very nature and aim of evaluation studies dictate a measurement before and after the intervention in question. While the advantages of longitudinal research are well known and documented (Kimberly, 1979; Pettigrew, 1990), there are some unresolved issues.

How many data collection points are necessary for a study to be longitudinal? How long between collection points is longitudinal? This study has two collection points reflecting pre and post intervention measurement. Pre intervention measurement occurred six months prior to the intervention while post measurement took place nine months after the intervention. Given this time span, another data collection point would not have been practical and may have reduced the quality of the data obtained.[1] There

[1] Campbell and Stanley (1966) argue that in studies dealing with human subjects, too frequent data collections is likely to have negative implications for the quality of data. In addition, it may not have been practical in terms of working time lost.

is an absence of guidelines in formulating an appropriate span of time between measurements. In addition, of particular importance in the evaluation of organizational change interventions, the researcher has little or no control over the change process which may affect the timing of the post measurement. Consequently, several issues may assist in the timing of a post intervention questionnaire. First, when could one reasonably expect the effects to occur? This clearly depends on the phenomenon under investigation. For example, a change in a group payment scheme may exhibit effects much quicker than an organizationwide intervention to change culture. Second, what guidelines do other organizational change interventions provide? Third, is the establishment of a post hoc control group necessary? If so, this may require the researcher to intervene earlier in the change process than otherwise necessary. Finally, the time lag between measurements may have a substantial effect on the results. For example, if Griffin (1988) had limited the time lag to 18 months in investigating the effects of QCs, a different conclusion would be reached compared to a time lag of 36 months.

The guideline from other evaluation of change studies indicate an initial post change intervention measurement between 6 months and one year. In other longitudinal research in TQM (Peccei and Wood, 1994; Wood and Peccei, 1995), a time span of one year was adopted. Consequently, the time lapse in this study is more common than not. It was important in this study to intervene early in the change process so that certain areas were largely unaffected by the change process and thus could act as a post hoc control group. However, one could plausibly argue that any observed changes or the assessment of the impact of the intervention is purely short term. This, is a limitation of this study.

To summarise, the longitudinal dimensions consisted of a two wave before and after study of the TQM intervention. The pre measurement occurred approximately six months prior to the intervention at which stage none of the individuals completing the questionnaire knew of the pending TQM intervention. Consequently, the baseline questionnaire was not contaminated or influenced by individuals' knowledge of the forthcoming intervention. The post measurement took place nine months after the commencement of the intervention. This short time span is a limitation of this study and the results may not be consistent with a longer term evaluation. Some other evaluation studies overcome this by assessing both the short and long term effects. However, in this study, the results need to be interpreted within the context of the time span allowed.

3.4.3 A comparison site

While it would have been ideal to include a comparison site in this study, it was not possible. As indicated in the previous chapter, a second site was selected based on its progress in and different emphasis on TQM. Having gained access, the procedures followed were similar to that of site 1 (this is discussed later). However, during the course of the case study, there were unforeseen circumstances by way of the sale of the site and redundancies that subsequently rendered the initial objective in using this site unfeasible. This highlights one of the inherent risks in conducting longitudinal research. For the purpose of this research, the role and emphasis assigned to the second site was modified.

The primary contribution of including the data from the second site (hereafter site 2) is in the testing of the models prior to evaluating the impact of the TQM intervention at

what is hereafter referred to as site 1. Thus, the models are more rigorously tested using two independent samples. Given, the different changes that occurred at the two sites, this allows a test of how robust the models are in predicting the dependent variables under different organizational conditions.

3.4.4 The questionnaires

The questionnaires used in this study are presented in Appendix 1. This includes the time 1 and time 2 questionnaires for supervisors and employees. The aim of this section is to discuss the design of the questionnaire in general terms due to the large number of measures it contains. For ease of clarity, the measures are discussed in detail in the relevant chapters.

In devising the questionnaires, three issues were given important consideration. These are dealt with in turn. First, to facilitate comparisons between groups, it was necessary for the questionnaire to be appropriate to a diverse range of respondents. Therefore, the questionnaire needed to be easily completed by unsophisticated respondents.

Second, where possible, previously validated scales were used. The issue of scale or measurement reliability is of particular importance in longitudinal studies. The relevant issue is the distinction between unreliability in measurement (error) and legitimate change in longitudinal studies. Therefore, scales need to exhibit high stability and yield reproducible results. The majority of the validated scales were taken from Warr, Cook and Wall (1979), Cook and Wall (1980) and Cook, Hepworth, Wall and Warr (1981). These researchers specifically set out to develop and validate a variety of quality of work life measures. Overall, evidence is provided to show that the developed scales are psychometrically adequate and stable. However, it was not possible to rely exclusively

on previously validated measures. Some of the concepts used in TQM are new and had not been operationalized when this study commenced. Thus, concepts such as quality awareness, perceived management and supervisory commitment to quality and commitment to improvement were created for this study. In the relevant chapters, these measures are discussed and reliability and factor analytic data are presented.

Finally, the questionnaire needed to include a comprehensive range of measures for two reasons. First, it was necessary to measure a relatively large number of antecedents of the dependent variables. Second, given the few evaluation studies of TQM and consequently, the lack of knowledge as to the impact of TQM interventions, a wide measurement net is in a better position to capture the intended and unintended effects of the intervention.

A pilot study was conducted on the full questionnaire at time 1 and the new questions added to the questionnaire at time 2 on a small sample of individuals. The priority in selecting participants for the pilot study was to include a diverse range of respondents from machine operators to senior managers. From the results of the pilot study, the major modification needed was the omittence from the employee questionnaire of their perception of their immediate supervisor's subscription to Theory X and Y. This has been successfully measured in another study (Fiman, 1973) which consisted of white collar employees. The employees in the pilot study who worked on the shop floor reported great difficulty in giving their perception of their supervisor's view of Theory X and Y. Consequently, these items were dropped from the employee questionnaire. The same items were retained in the supervisory questionnaire which asked supervisors for their own view. In addition, an open ended question asking respondents' interpretation of TQM was omitted due to its non response in the pilot.

The previously validated scales were replicated insofar as possible in this questionnaire. This included the presentation of the items in a scale in a block prior to moving on to the next scale. This strategy was also used with the new measures created for this study. In terms of the ordering of the measures within the questionnaire, the more sensitive questions relating to an individual's perception of their immediate boss or questions relating to management were placed in later sections of the questionnaire.

3.4.5 Data collection

Prior to outlining the actual data collection method, the introduction process at the beginning of this study is briefly described. Subsequent to access being agreed upon with the general manager, the next step involved meeting the union representatives. This allowed them the opportunity to raise any questions or concerns they may have regarding the research. At the site four times a year is a communications day whereby all employees in groups are given a forty minute presentation on relevant issues to the site. This provided the opportunity for me to introduce myself to the entire work force, describe in general terms the research and state my independence from management at the site and from the overall organization. All these steps were taken to facilitate the continued co-operation needed.

On the basis of a list of all employees by work area or functional area, a stratified random sample of 40% was taken. This procedure was only applied to employees as it was necessary to include all managers and supervisors (except the executive team) in the sample. Having identified the individuals selected to participate, they were asked if they would be willing to complete a questionnaire and informed that it was voluntary. Supervisors, managers and engineers completed the questionnaire in a group situation under my supervision. This provided a further opportunity for individuals to raise

questions and allowed me to alleviate any concerns over the use of identification numbers for the purpose of tracking individuals over time. Most of the employees completed the questionnaire on a one to one basis during work time. This method although time consuming was deemed to be superior to self administered questionnaires and also provided an opportunity to gain further information regarding the organization and its climate. By completing the questionnaires using this method, it was felt that the length of the questionnaires could exceed that of a self administered questionnaire. This data collection method was replicated for the time 2 questionnaire.

3.4.6 Sample characteristics

At time 1, of the 255 individuals (40% of employees and all supervisory personnel excluding the General Manager and the executive management team) asked to complete the questionnaire, 241 did so yielding a response rate of 94.5%.[2] Of the 241 participants, 186 were employees and the remaining 55 were in a supervisory position. At time 2, the participant sample was reduced to 216 primarily as a result of individuals leaving the organization in the intervening period. Table 3.1 presents a summary of the sample characteristics of site 1.

The participant group was 94% male, with a mean age of 47.6 years, a mean organizational tenure of 18.2 years and a mean job tenure of 8.3 years. The majority of the sample (35.6%) were machine operators, 22.2% craftsmen and 23.2% in a supervisory position. The sample characteristics of site 2 are presented in Appendix 2 and differ from site 1 except for work force composition and job categories.

[2] At site 2, 316 completed the questionnaire at time 1 and this was reduced to 228 at time 2 primarily as the result of redundancies occurring in the intervening period. Of the 228 participants at time 2, 183 were employees and 45 managers / managers.

Table 3.1: Sample characteristics of site 1

		Site 1	
1. Mean Age (S.D)		47.6 years	(9.8)
2. Length of time in present job (S.D)		8.3 years	(7.6)
3. Length of service with organization (S.D)		18.2 years	(9.5)
4. Length of service at site (S.D)		16.8 years	(10.4)
5. Gender			
Male	(% of sample)	203	(94%)
Female	(% of sample)	13	(6%)
6. Job Categories			
Operators	(% of sample)	77	(35.6%)
Craftsmen	(% of sample)	48	(22.2%)
Engineers & Material controllers	(% of sample)	43	(19.0%)
Clerical/Administrative	(% of sample)	17	(8.0%)
Supervisors/Managers	(% of sample)	51	(23.2%)

3.5 Ideal vs. actual research design: limitations

Three particular features of an ideal research design were discussed; a longitudinal dimension, a control group and other changes that may occur concurrent with the intervention. In an ideal research design, a number of post intervention measurements would be taken in order to capture the process of change and also provide a short and long term evaluation. The latter element would help assess the temporal validity of the short term findings. Regarding the control group, the ideal situation would be a comparable group removed from the intervention group so as to avoid the potential effects of contamination. Finally, it would be ideal not to have other changes occurring that may potentially have an effect on an evaluation of the outcomes of the intervention.

Briefly, the actual research design employed involved one post intervention measurement at nine months and did not contain a 'proper' control group. These two

issues may be considered limitations of this study. Consequently, this study can only evaluate the TQM intervention in the short term and the results must be interpreted with this in mind. However, this time span did permit the establishment of a post hoc control group; at the time of the second round questionnaire, approximately 50% of employees were participating in the intervention thus providing a balanced variation between participants and non participants.

Regarding other changes that may complicate the evaluation of the intervention, insofar as it was possible, these changes were anticipated and controlled for. These changes included a change in supervisor, a substantial change in job content and a change of jobs which could potentially have a significant effect on an individual's team orientation and commitment to improvement. While these type of changes were controlled for, the extent to which they occurred were minimal. For example, between time 1 and time 2, only 8 out of the 165 employees had changed jobs, 34 employees had a different supervisor at time 2 and 20 employees reported a substantial change in the content of their jobs.[3] Therefore, the occurrence of other changes did not pose a problem in this study given that the major change at the site was the intervention and the other changes were minimal.

Perhaps, the key question is whether the research design adopted is 'good enough' to address the research questions. Clearly, more studies than not fail to achieve in practice the ideal research design. In reality, very few studies adopt a long term systematic approach to the evaluation of organizational change interventions dealing with individuals. Thus, the long term perspective adopted by Wall et al. (1986) and Griffin (1988) of 30 and 36 months respectively is more unusual than not. Given the threats of, for example, mortality, a lack of control over organizational events and perhaps denied

[3] For the overall site sample (including supervisors), 15 out of 216 had changed jobs, 34 reported a substantial change in their jobs and 50 had a change of supervisor between time 1 and time 2.

access, these make long term evaluations more difficult. Therefore, while the time span is an obvious limitation, it is not unusual.

The more serious limitation may be the absence of an a priori control group. However, the only viable method to overcome this was to establish a post hoc control group in terms of obtaining variation between employee participation in the intervention. Overall, these limitations must be weighed against the strong points of the research design and also the overall contribution of the research.

3.6 Data analysis

The aim here is to outline the statistical procedures used to examine the impact of the intervention on the outcomes of teamwork and continuous improvement.

A two staged approach was adopted to the assessment of the impact of the intervention. The first stage involved the construction of theoretical models containing hypothesized antecedents of the specified outcomes of TQM. For example, in the model of the antecedents of team orientation, theoretically justified antecedents such as trust in colleagues and supervisor participative style were included. Consequently, the first empirical stage required the testing of the antecedent models to assess how reasonable they were in predicting the outcomes. As mentioned earlier, this model was tested using two independent samples to assess the robustness of the model. Once this stage was completed, the models were used as the basis for evaluating the impact of the intervention.

The statistical techniques used were required to match the logic underlying the evaluation approach and also simultaneously cope with a large number of independent

variables. Consequently, path analysis using Ordinary Least Square (OLS) multiple regression was employed. Path analysis permits the estimation of the relative total impact of a number of variables within a model. While it allows the relative impact of variables to be estimated, path analysis cannot establish causality or confirm the hypothesized causal model. Thus, if a theoretical causal model is incorrect regarding the ordering of the variables, then the path analysis and the relative impact of the variables may be misleading.

Path analysis using OLS multiple regression requires two stages. First, the intervening variables (antecedents) are regressed separately on the intervention and control variables. Subsequently, the dependent variable (i.e. the outcomes of TQM) is regressed on all the variables in the model. The resulting path coefficients (standardized beta coefficients) were used to assess the direct, indirect and total effects of the TQM intervention on the dependent variables. For ease of clarity, the relevant intercorrelation tables for each of the results chapter are presented in Appendix 3.

3.7 Conclusions

This chapter presented an overview of the research methodology employed in this study. This involved outlining an ideal research design based on the research questions and subsequently using this to assess the limitations of the actual research design employed. The most serious limitation of the research design employed is the absence of an a priori control group. However, the naturally occurring variation in terms of employee participation in the intervention allowed the establishment of a post hoc control group.

The underlying logic of the approach adopted to evaluate the intervention was outlined. The initial stage involved examining the antecedents of the TQM outcomes. As the subsequent chapter will show, theoretical models containing hypothesized antecedents of the dependent variables are constructed and empirically tested using two independent samples. Subsequently, these models are used as a basis to evaluate the total impact of the intervention. The statistical procedure employed was path analysis using OLS multiple regression. This permitted the relative impact of each of the TQM intervention variables to be estimated.

This chapter and the previous two chapters have raised the research questions, provided a descriptive account of the organization and the TQM intervention and discussed the research methodology employed in this study. The subsequent chapters present the findings. This commences with the antecedents of team orientation in the next chapter as a precursor to evaluating the impact of the intervention on team orientation in chapter 5.

Chapter 4: The Antecedents of Team Orientation

4.1 Introduction

The notion of teamwork is ubiquitous in the literature on TQM. For many contributors, teamwork, in addition to continuous improvement and customer satisfaction characterize TQM as a philosophy (Dean and Bowen, 1994; Sitkin, Sutcliffe and Schroeder, 1994). Although it is used pervasively, there is some ambiguity as to what teamwork involves and who it is directed to. Adopting a broad criterion of applicability, the notion of teamwork applies to all organizational members. It may be viewed as having four facets: within a natural work group, between different functional departments, between managers and employees and finally, between organizations; customers and suppliers. While teamwork may apply to these different groups, there is a common underlying theme; a willingness to co-operate.

Between customers and suppliers, teamwork manifests itself in co-operative efforts to achieve mutual benefits in terms of synergy and loyalty (Dean and Bowen, 1994). Cross functional teamwork is based on the optimization of the whole system rather than the attainment of functional outcomes. Functional barriers are dismantled through the creation of a cross functional teamwork culture via the internal customer principle. Teamwork between managers and employees is based on co-operation: employees co-operate by contributing to continuous improvement; highlighting problems that prevent them from doing quality work and suggesting ways that their own work, the work of their group or the activities of the organization may be improved. Managers reciprocate by facilitating employee contributions to improvement in terms of providing training, setting up mechanisms by which suggestions are reviewed and action taken. The focus of this chapter is on teamwork within a natural work group and it is to this we now turn.

What does teamwork mean when it is applied to employees? There seem to be two interpretations that are evidenced in the literature although a distinction is not always made explicit. The first interpretation focuses on work restructuring and the second emphasises an individual's orientation toward the work group. The first perspective is probably better reflected under the title of team based working. This involves a restructuring of work away from individually designed tasks to group based tasks. In manufacturing organization, this may be known as a "cell" based structure where employees work in teams which are themselves mini organizations grouped around a product or component. The team takes on the responsibility for the product from its manufacture to its delivery to the internal or external customer. Within this structure, there are great variations as to the extent of responsibilities given to the team with self managing teams as the ideal structure (Juran, 1989). This is analogous to the autonomous work groups (AWGs) advocated by and stemming from the work of the socio-technical systems theorists (Emery and Trist, 1969; Rice, 1958; Trist and Bamforth, 1951).

However, it is debatable whether team based working in the context of TQM parallels the self determination of AWGs in terms of the range of responsibilities given to the group (e.g collective participation in recruitment and an absence of direct supervision; Wall et al., 1986). What may be more common is that the team is given responsibility for issues directly related to quality and improvement issues. Thus, the team is allocated responsibility for quality (through the self inspection principle) and for improving the effectiveness and productivity of the work group (Sewell and Wilkinson, 1992). As Wilkinson (1992) states, "*...responsibilities should be team rather than individual ones, since this makes mistakes and risk taking easier for individuals to bear*" (p 327).

This perspective on teamwork, in essence, views it as a structure; a method of structuring work around a group of individuals. As such, this was implemented at the site prior to the TQM intervention in the form of a cell based structure. If work is restructured around a team creating interdependence of individual tasks and consequently, highlighting the importance of co-operative activity, does this mean that individuals will necessarily adopt a team orientation? This leads to the second perspective on teamwork which emphasizes teamwork as an attitude or value and may be more appropriately titled team orientation. The latter perspective was one of the objectives of the intervention and this was consistent with the "cultural" emphasis of implementing a 'soft' TQM intervention.

Bushe (1988) describes a total quality culture in terms of norms, values and reward procedures that emphasize holistic behaviour oriented toward co-operation with fellow organizational members. Waldman (1994) argues that it may be difficult to separate work performance in terms of formal role requirements from organizational citizenship behaviour in the context of TQM. He asserts that in a total quality culture, work performance would include taking initiatives beyond the call of duty, sharing information with and helping co-workers. Blackburn and Rosen (1993) in reviewing TQM and HRM of the Baldrige Award winners contrast traditional versus TQM paradigms toward organizational culture and HRM practices. They highlight a shift in cultural emphasis from individualism to collective efforts. Anecdotal evidence is provided that successful TQM companies rely on co-worker assessment of an individual's team orientation as one criteria in measuring an individual's contribution to teamwork. Along a similar vein, Drummond and Chell (1992) note that all employees *"will need to adopt holistic approaches to work based on co-operation"* (p5).

In other words, this second perspective on teamwork provides insight into the social system; it relates to the interaction of team members and an individual's orientation toward the team. Here, it is the second perspective; team orientation, that is the focus of investigation of this chapter.

Implicit in the mainstream literature is a positive view of the collaborative efforts and co-operative interaction within the team. In other words, the notion of team orientation is viewed as beneficial to the achievement of the team's objectives as defined by management. Boje and Winsor (1993) argue that peer pressure is a more compelling method of worker control than hierarchical control. Workers are made to feel a sense of obligation to other members. This assumes that the norms and values of the team are congruent with the organization. This may not necessarily be true. It has previously been shown that workers can negatively deviate from organization-defined norms. In other words, individuals may co-operate with and exert effort for other team members for reasons other than the effective functioning of the group as defined by management. Instances such as restriction of output could be interpreted as a willingness by an individual to exert effort on behalf of other members (to help maximise their earnings). Roy (1952), Burawoy (1979) and Roy (1969) present evidence of "goldbricking" and "making out" where workers co-operated with each other to improve their own conditions.

Following the thinking of TQM, this chapter assumes that team orientation assists the functioning of the team and is congruent with the objectives of management. However, it is acknowledged that team orientation may exist for other reasons but this is not explored here.

As mentioned in chapter 3, it is important in an evaluation of the impact of a TQM intervention to examine the direct and indirect effects of the intervention on, in this case, team orientation. Consequently, this chapter empirically tests a model containing hypothesized antecedents of team orientation which may be subsequently used to assess the full effects of the intervention on team orientation. As a starting point, the chapter begins by examining the definition of team orientation employed here. Subsequently, the hypothesized model containing the antecedents of team orientation is outlined. The measures used and the analysis procedures adopted are described prior to empirically testing the hypothesized model of team orientation on two independent samples (site 1 and site 2). Overall, the objective of this chapter is to assess how reasonable the hypothesized model is as a basis for evaluating the impact of the intervention on team orientation at site 1 in the subsequent chapter.

4.2 Team orientation

This section presents a definition of team orientation, and outlines the model containing the hypothesized antecedents of team orientation to be tested using the data from the two sites.

4.2.1 Definition of team orientation

The concept of team orientation can be viewed and interpreted as having two distinct dimensions. The first dimension taps an individual's orientation toward the team / work group while the second dimension taps the degree to which a team orientation is reinforced by other members of the team or work group. Neither dimension on its own fully captures team orientation. If one were to rely exclusively on measuring team orientation from the first perspective, one may get a distorted view of team orientation.

For example, an individual may feel part of a work group and may be willing to exert effort for the work group but within the work group, this is neither valued nor encouraged. Consequently, while an individual may be oriented toward the team, other members may not encourage team orientation. In order to obtain a more complete view of team orientation, a measure would have to include an individual's orientation toward the team as well as his or her perception of whether this team orientation is encouraged by other team members. The definition used here includes both components captured by the following questions in the questionnaire:

- I feel I am really part of my work group
- I am willing to put myself out to help my work group
- The people in my work group encourage each other to work as a team

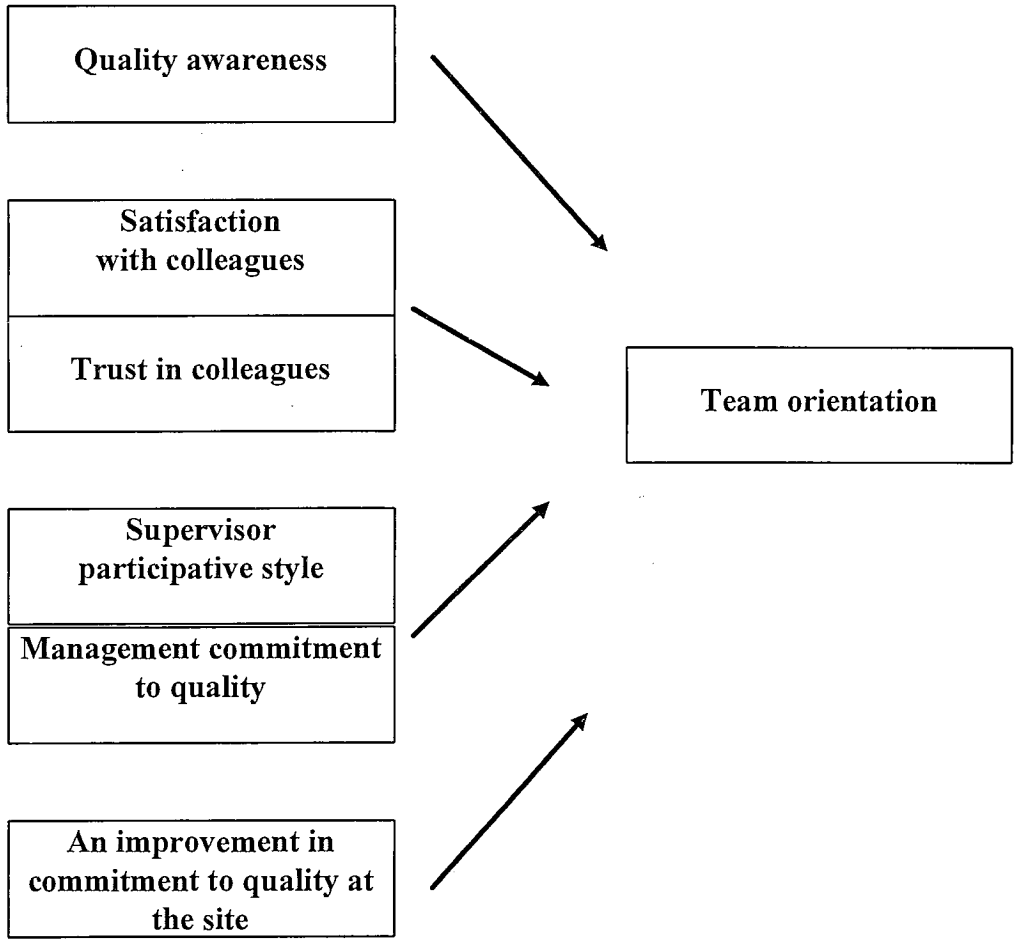
The first question taps an affective dimension of an individual's orientation toward the work group. This type of identification has been previously used in a study of intergroup relations (Brown and Williams, 1984). However, strong identification with the work group is arguably not sufficient in itself to tap the importance an individual attaches to his/her team orientation. The rationale is simply that an individual may feel part of his/her work group but may not be willing to put himself/herself out to help the team. Consequently, what is needed is a behavioural element; that is, whether individuals are willing to put themselves out to help the work group. This is akin to what Waldman (1994) argues is one element of an individual's work performance in the context of TQM. Finally, the last question taps the degree to which individuals perceive a team focus to be encouraged by other members in the group.

4.2.2 The antecedents of team orientation

The hypothesized model containing the antecedents of team orientation is depicted in Figure 4.1. Team orientation is viewed as the outcome of four categories of predictors: individual, colleagues, leader and climate. Each category is discussed in turn beginning with the individual category.

Individual and team orientation This category contains one predictor; an individual's quality awareness which is hypothesized to have a positive influence on an individual's team orientation. In other words, individuals who have heightened awareness of the importance of quality for the organization and their work group are more likely to exert effort on behalf of their work group. The knowledge of the consequences of an individual's actions as well as the interdependence of individual actions in relation to quality may provide a uniting goal for members and consequently affect their orientation toward the team.

FIGURE 4.1: Hypothesized model of the antecedents of team orientation



Colleagues and team orientation This category consists of two predictors that tap an individual's attitude toward the colleagues they work with. These include an individual's satisfaction with their colleagues and trust in their colleagues. Individuals who are more satisfied with their colleagues, and who have greater trust in their colleagues are hypothesized to be more likely to have a positive team orientation and to view it as being encouraged within the work group.

"Perhaps there is no single variable which so thoroughly influences interpersonal and group behaviour as does trust" (Golembiewski and McConkie, 1975, p131). In terms of the relationship between trust and co-operation, the direction of causation is subject to debate. Deutsch (1962) argues that trust is the central prerequisite of co-operation while others (Tedeschi, Hiester and Gahagan, 1969; Boyle and Bovacich, 1970) provide evidence that there is reciprocity of influence between trust and co-operation. From this perspective, it is argued that a co-operative environment will induce trust in addition to trust facilitating co-operation.

In this study, trust in colleagues taps two dimensions: a belief that co-workers would assist the individual should the need arise and; an individual's confidence in the ability of his/her co-workers. Thus, if an individual believes his/her co-workers will help them out, they, in exchange will be more likely to put themselves out for the work group and perceive others, through their helping behaviour or perceived intention to do so, as encouraging teamwork. It is plausible that the relationship between trust in colleagues and team orientation is reciprocal. It is possible to test the nature of this relationship between trust in colleagues and team orientation (albeit a weak test) using cross lagged regressions. Thus, if trust in colleagues at time 1 has a significant effect on team orientation at time 2 and team orientation at time 1 does not have a significant effect on

trust in colleagues at time 2, this would indicate that the relationship was not reciprocal but rather suggest that trust in colleagues is an antecedent of team orientation. The results of the cross lagged regressions[1] for site 1 and 2 are presented in Appendix 4 and 5 and support treating trust in colleagues as an antecedent of team orientation. This would be consistent with Zand's (1972) finding that trust was related to affective attachment. Thus, individuals who trust their colleagues are more likely to identify with their work group.

Satisfaction with colleagues is hypothesized to have a positive effect on team orientation. The more an individual likes his/her colleagues, the greater the likelihood that they will feel part of the group and be willing to put themselves out to help the group. Once again, it is possible that the relationship is reciprocal; the more an individual likes his/her colleagues, the greater the team orientation, and the more a team orientation is encouraged by other members, the greater an individual's satisfaction with colleagues. As in the case of trust in colleagues, cross lagged regressions were conducted to shed light on the relationship between satisfaction with colleagues and team orientation. If the relationship was reciprocal, one would expect to find satisfaction with colleagues at time 1 having a significant effect on team orientation at time 2 and team orientation at time 1 having a significant effect on satisfaction with colleagues at time 2. The results (Appendix 4 and 5) indicate that team orientation at time 1 did not have a significant effect on satisfaction with colleagues at time 2 thereby providing support for treating satisfaction with colleagues as a predictor of team orientation.

[1] Each of the hypothesized predictors at time 2 was regressed separately on all other variables in the model (including the predictor) measured at time 1.

Leader and team orientation. The behaviour and attitude of an individual's immediate boss and of management more generally are hypothesized to positively affect team orientation. More specifically, team orientation is hypothesized to be positively affected by the participative style of the immediate supervisor. Leadership has been conceptualized as a process whereby a leader seeks to influence followers' beliefs and values resulting in behavioural changes (Yukl, 1989). In terms of Lewin's (1943) psychological proximity, the immediate boss, as he/she is more proximal to the individual is in a position to shape an individual's behaviour and the interaction of individuals within the work group. In other words, the participative style of the leader who facilitates, values and reinforces a team emphasis is likely to shape an individual's team orientation and the degree to which it is encouraged within the group. This would be consistent with Human Relations theory which argues that leaders can develop their members into a working team with high loyalty using participation (Likert, 1961).

In addition, perceived management commitment to quality is hypothesized to affect team orientation. In the TQM literature, critical importance is placed on management commitment to quality values (Deming, 1986 and ; Juran, 1989; Oakland, 1989; Dale and Cooper, 1992) as it portrays to organizational members what is important and signals the attitudes and behaviours that are valued. Thus, a committed management team would set an example of co-operative behaviour within their own hierarchy, communicate and reinforce team values to the lower levels and support co-operative efforts and interaction.

Climate and team orientation. The final factor of an improvement in commitment to quality in general at the site reflects an individual's perception of a change in the cultural emphasis or value given to quality within the organization and associated values and practices such as teamwork. This is hypothesized to have an

impact on shaping an individual's team orientation and perception of teamwork within their work group. Previous research has highlighted the importance of climate perceptions in affecting individual attitudes and behaviour (Scott and Bruce, 1994; Schneider, 1983a).

Within the categories outlined, the predictors may be labelled as either directly tapping quality related attitudes and perceptions or not. This is important in light of the lack of theoretical grounding underlying TQM. Consequently, the predictors that explicit tap quality attitudes and perceptions may best be treated as exploratory predictors. One could expect a TQM intervention to affect quality awareness, perceived management commitment to quality and quality climate. However, whether these factors in turn affect team orientation is open to empirical testing. Unlike the other hypothesized predictors, these "quality" predictors are not grounded with a strong theoretical rationale and thus need to be considered more as exploratory predictors.

4.3 Measures

As discussed in chapter 3, where it was possible, measures which had been previously validated were used. In the forthcoming discussion of the measures, the source of the previously validated measures is highlighted. Unless otherwise indicated, responses to the questionnaire items were scored on a seven point Likert scale measuring a respondents' satisfaction/dissatisfaction or agreement/disagreement with an item. The change variables were computed by subtracting the Time 1 scores from the Time 2 scores to assess the amount of change that had occurred in each of the measures over time. For the purpose of clarity, the alpha coefficients are given for the combined site 1 and 2 sample at time 1 and 2.[2]

[2] The alpha coefficients for the individual site samples do not vary much from the combined sample.

Team orientation This is a three item scale tapping team orientation. It consists of two dimensions: (i) the degree to which an individual is oriented toward the work group and (ii) the degree to which a team emphasis is perceived to be reinforced by other members in the group. The alpha coefficient for this scale was .76 at time 1 and .68 at time 2.

Quality awareness This variable was measured using a four item scale constructed to tap respondents' awareness of the importance of quality. The items tap two dimensions; (i) awareness of the importance of quality work and continuous improvement for the organization and (ii) specific ideas to improve the quality of work in the work area. The alpha coefficients for this scale was .60 at time 1 and .54 at time 2.

Trust in colleagues This was measured using Cook and Wall's (1980) six item interpersonal trust in peers scale. This scale taps two dimensions of interpersonal trust; (i) faith in the trustworthy intentions of others and (ii) confidence in the ability of others. The results of the factor analysis provide support for the factorial independence of this measure of trust in colleagues and team orientation (see Appendix 6 and 7). The scale exhibited high levels of reliability at time 1 and time 2, .86 and .85 respectively.

Satisfaction with colleagues This is a single item measure taken from Warr, Cook and Wall's (1979) overall job satisfaction scale that taps respondents' satisfaction with their colleagues. As this is a single item measure a reliability coefficient was not calculated.

Supervisor participative style This variable refers to the extent to which respondents' perceive their immediate boss as being participative and supportive in their

behaviour. The items tap two dimensions: (i) the degree to which the immediate boss encourages participation and facilitates the group working together and (ii) the extent to which the immediate boss supports the individual in their work and makes use of their work knowledge and abilities. The alpha coefficient for this seven item scale was .86 at time 1 and .88 at time 2.

Management commitment to quality This variable refers to perceived management commitment to quality. The item taps two dimensions of the concept; (i) the extent to which management is perceived to set an example of quality behaviour in their own work and (ii) the extent to which management is perceived to facilitate employees doing quality work and provide support for quality improvements. This six item scale exhibited high levels of reliability, .84 and .89 at time 1 and time 2 respectively.

Improvement in commitment to quality This five item scale measured at time 2 taps respondents' assessment of whether people in general in the organization had become more committed to quality during the previous year. This measure was designed to tap greater perceived commitment to quality in the organization as a whole and, as such, is conceptually distinct from the measure of perceived management commitment to quality. The results of factor analysis provide support for the factorial independence of these two measures (see Appendix 8 and 9) The alpha coefficient for this scale at time 2 was .89.

Control variables These included respondents' age, gender, organizational tenure, length of time in present job and job title. Three dummy variables were created for job title (direct production employees, qualified employees connected with production and administrative employees) with direct production employees being used as the

reference category. Three additional control variables were added at time 2; whether respondents' had the same immediate boss as they did when they completed the first questionnaire; if the content of their job had changed substantially and if they changed their jobs between time 1 and time 2.

4.4 Analysis procedures

The model outlined in Figure 4.1 assumes that team orientation is endogenous in relation to the other variables and consequently that it is appropriate to treat team orientation as the dependent variable. It is possible to test the endogeneity assumption through the use of cross lagged regressions. This has previously been discussed for the specific variables of trust in colleagues and satisfaction with colleagues. Here, this analysis is extended to all the other hypothesized predictors of team orientation. This involves regressing the individual predictor variables measured at time 2 on team orientation measured at time 1. The results are shown in Appendix 4 for site 1 and Appendix 5 for site 2. At site 1, team orientation at time 1 did not have a significant effect on any of the predictor variables at time 2. This was also found to hold true for site 2. Consequently, the results lend support for treating team orientation as a consequence rather than an antecedent of the predictor variables thus rendering it appropriate to use team orientation as the dependent variable in the analysis.

Having established that is appropriate to use team orientation as the dependent variable, the next stage is to assess how reasonable the antecedent variables are in predicting team orientation. This was tested using Ordinary Least Squares (OLS) regression and involved regressing team orientation on the antecedent and control variables. This analysis was conducted on the time 2 cross sectional data and the change data. In

addition, the analysis was conducted separately on the employee[3] sample from site 1 and site 2. The inclusion of site 2 in the testing of the antecedents of team orientation will help determine the robustness of the antecedent model. The greater the consistency of the antecedents in two different organizational contexts, the more robust the model is. The subsequent section presents and discusses the results of the antecedents of team orientation using the samples from the two sites.

4.5 An empirical testing of the antecedents of team orientation

Prior to presenting the results, the descriptive statistics are presented for the two sites.

4.5.1 Descriptive Statistics

Table 4.1 presents the results of the t-tests and paired samples t-tests for the individual site samples. The statistics presented are for the antecedent and dependent variables used in the model. As mentioned in chapter 3, for ease of clarity, the intercorrelations between the model variables of each of the results chapters are presented in Appendix 3.

[3] Team orientation was not measured at supervisory and managerial levels due to the difficulty in translating the notion of a work group to this level.

Table 4.1: Independent t-tests and paired sample t-tests for the individual site samples (employees)

Variables Site 1 (N=165)	Time 1 Mean (S.D)	Time 2 Mean (S.D)	Change scores Mean (S.D)
Team orientation	5.73 (0.89)++	5.60 (0.90)+++	-.13 (.085)*
Trust in colleagues	5.67 (0.93)+++	5.68 (0.91)++	.01 (0.76)
Satisfaction with colleagues	5.67 (1.06)	5.61 (0.95)++	-.06 (1.12)
Quality awareness	5.99 (0.67)+++	5.95 (0.65)	-.04 (0.59) ++
Supervisor participative style	4.98 (1.12)	5.15 (1.10)+++	.17 (1.08)**+++
Management commitment to quality	5.10 (1.01)+++	5.27 (1.04)+++	.17 (0.86) **+++
Improvement in commitment to quality		4.84 (1.06)+++	

Site 2 (N=183)	Mean (S.D)	Mean (S.D)	Mean (S.D)
Team orientation	5.50 (1.08)++	5.30 (1.15)+++	-.20 (1.16)**
Trust in colleagues	5.39 (1.00)+++	5.42 (1.01)++	.03 (0.99)
Satisfaction with colleagues	5.54 (0.91)	5.36 (1.13)++	-.18 (1.24)*
Quality awareness	5.79 (0.77)+++	5.91 (0.69)	.12 (0.72)**++
Supervisor participative style	4.85 (1.20)	4.63 (1.34)+++	-.22 (1.41)**+++
Management commitment to quality	4.74 (1.17)+++	4.09 (1.26)+++	-.65 (1.07)***+++
Improvement in commitment to quality		3.98 (1.35)+++	

* T-test difference between Time 1 and Time 2 significant at < than .1 level
** T-test difference between Time 1 and Time 2 significant at < than .05 level
*** T-test difference between Time 1 and Time 2 significant at < than .01 level
+ T-test difference in means between Site 1 and Site 2 significant at < than .1 level
++ T-test difference in means between Site 1 and Site 2 significant at < than .05 level
+++ T-test difference in means between Site 1 and Site 2 significant at < than .01 level

There has been a significant negative shift in the team orientation at the two sites. This is the only significant negative change at site 1. Trust in colleagues, satisfaction with colleagues and quality awareness have remained stable over time for the sample of employees at site 1. In terms of change, there has been a significant positive shift in perceived supervisor participative style and perceived management commitment to quality.

At site 2, in addition to the significant negative shift in team orientation, there have been significant negative changes in the following: satisfaction with colleagues,

perceived supervisor participative style and perceived management commitment to quality. While trust in colleagues has remained stable over time, quality awareness is the only variable at site 2 to have significantly shifted in a positive direction.

Comparing the two sites at time 1, significant differences were found in team orientation, trust in colleagues, quality awareness and perceived management commitment to quality with site 1 being more positive. At time 2, there are significant differences in all the variables (except quality awareness) with site 1 being more positive. In terms of the changes that occurred over time, significant differences were found between the two sites in changes in quality awareness, supervisor participative style and management commitment to quality. Regarding the climate measure of improvement in commitment to quality at the site, site 1 was found to be significantly more positive.

4.5.2 Results

Table 4.2 presents the results of the impact of the antecedent and control variables on team orientation using the cross sectional time 2 data for site 1 and site 2. Table 4.3 presents the results of the same analysis using the *change* data. The standardized beta coefficients are shown for the antecedent variables. For clarity, the impact of the control variables are not shown.

Table 4.2: **The impact of the antecedent and control variables on team orientation at time 2**

Antecedents of Team Orientation at time 2	Site 1	Site 2
Satisfaction with colleagues	.10	.11+
Trust in colleagues	.26***	.24***
Quality awareness	.12**	.09
Supervisor participative style	.22***	.25***
Perceived management commitment to quality	.06	.20***
An improvement in commitment to quality at the site	.08	.13**
Adjusted R^2	.49	.54
N	165	179

+ = p<.10 ** = p<.05 *** = p<.01

Several points are worth noting. The significant antecedents of team orientation at site 1 come from the individual, colleague and leader categories. However, at site 2, the significant categories are colleague, leader and climate. The key difference in the antecedents between the two sites are as follows: quality awareness is significant at site 1 but not at site 2 and perceived management commitment to quality and an improvement in commitment to quality at the site are significant at site 2 but not at site 1.

Table 4.3: **The impact of *changes* in the antecedent variables (and the control variables) on *changes* in team orientation**

Antecedents of *changes* in team orientation	Site 1	Site 2
Δ in satisfaction with colleagues	.21***	.16**
Δ in trust in colleagues	.33***	.14+
Δ in quality awareness	.19***	.10
Δ in supervisory participative style	.11	.27***
Δ in perceived management commitment to quality	.05	.10
An improvement in commitment to quality at the site	.07	.08
Adjusted R^2	.26	.22
N	164	179

+ = p<.10 ** = p<.05 *** = p<.01

In predicting *changes* in team orientation, there is a greater consistency between the two sites with the significant antecedents being those that are proximal to the individual's work environment. At site 1, similar to the cross sectional results, *changes* in quality awareness has a significant impact on *changes* in team orientation. Similarly, at site 2, a consistent effect on team orientation is supervisor participative style.

4.6 Discussion

The lack of consistency in antecedents between the two sites is the first issue that needs to be addressed prior to discussing the results in greater detail. In terms of the antecedents, the main discrepancies between the two sites centre on the significant effect of quality awareness at site 1 but not at site 2, the effect of perceived

management commitment to quality and an improvement in commitment to quality at site 2 but absent at site 1. This difference was found in the results of the cross sectional analysis. Regarding the results of the *change* data, the difference involves the impact of changes in quality awareness at site 1 and the impact of *changes* in supervisor participative style at site 2. The results raise two questions. First, is it the nature of the changes that have occurred in the intervening time period at the two sites that has led to different predictors of changes in team orientation? Second, is it the actual model of team orientation that is fundamentally flawed?

A weak test of the latter issue would be to investigate the antecedents of team orientation prior to the changes occurring in the intervening period. This involves regressing team orientation at time 1 on the antecedent and control variables measured at time 1.[4] The results are presented in Table 4.4 (the control variables are not shown). As Table 4.4 shows, there is total consistency between the two sites in the antecedents of team orientation. Overall, the results support the model, in at least predicting variations in team orientation. This would seem to indicate that the hypothesized model is not inherently flawed.

[4] One of the intervening variables measured at time 2; an improvement in commitment to quality at the site was not measured at time 1. Three other control variables; change in supervisor, change in job content and change of jobs were not measured at time 1.

Table 4.4: The impact of the antecedent and control variables on team orientation at time 1

Antecedents of Team Orientation at time 1	Site 1	Site 2
Satisfaction with colleagues	.18**	.25***
Trust in colleagues	.32***	.13+
Quality awareness	.21***	.18***
Supervisory participative style	.23***	.33***
Perceived management commitment to quality	.12+	.11+
Adjusted R^2	.45	.48
N	166	179

+ = p<.10 ** = p<.05 *** = p<.01

Therefore, a more likely explanation for the differential results obtained across the two sites may be the nature of changes that have occurred at the two sites between time 1 and time 2. This may be a result of different changes triggering different effects. Broadly speaking, taking the cross sectional and *change* data, the categories of colleagues and leader (immediate) seem to be more robust than the individual and climate categories.

There is consistency between the two sites in the factors that affect *changes* in team orientation, these factors are proximal to the individual. This is consistent with the concept of psychological proximity, from field theory. Consequently, factors closer to the individual will influence an individual's reaction more immediately than factors more removed from the individual such as perceived management commitment to quality and an improvement in commitment to quality at the site. Applying this argument to change, one would expect changes in the proximal factors to have a more immediate impact than changes in the more distant factors. The results from the two sites would provide support for this. This is not to say that the more distant factors are

redundant, field theory suggests that the influences of the distant factors are mediated by the proximal factors. For example, it is quite plausible that management commitment to quality has an impact on supervisory behaviour which in turn has an impact on team orientation at the employee level.

An interesting result is that changes in supervisor participative style did not have an impact on changes in team orientation at site 1. Individuals at site 1 who perceived their immediate boss as participative reported higher levels of team orientation but that increased participative behaviour did not lead to higher levels of team orientation. Overall, at site 1, perceived supervisor participative style significantly increased between time 1 and time 2. Consequently, a possible explanation for the lack of effect of changes in participative style on changes in team orientation may be due to the operation of a threshold effect. What this means is that a certain degree of supervisor participative style may be a precondition for team orientation but increases beyond a certain point have no further effect on team orientation.

A crude test of a threshold effect would be to look at the correlation between changes in supervisor participative style and changes in team orientation for those above and below the threshold level. If a threshold effect was in operation, one would expect no relationship between the two variables above the threshold level while a positive one would exist for those below the threshold level. The sample at site 1 was divided into two categories at time 1; above and below the threshold level.[5] For individuals above the threshold level at time 1, the relationship between changes in supervisor participative style and changes in team orientation was .06 and not significant. For individuals who were below the threshold level at time 1, the relationship between the

[5] The designation of a threshold level seems to be an arbitrary decision. The level chosen in this situation was the mid point where 50% of respondents were below and 50% of respondents were above. This point was 5.2 on a 1-7 scale.

two variables was .26 and significant at the .05 level. These results would support the existence of a threshold effect and also support the contention that beyond a certain point, greater participation by the supervisor does not result in greater team orientation.

Across the two sites, the categories of colleagues and leader (immediate) seem to be more robust than the individual and climate categories in predicting variations in and changes in team orientation. Overall, the significant antecedents of team orientation are proximal to the individual; colleagues and immediate supervisor. In view of the different contexts at site 1 and site 2, the model containing the antecedents is broadly useful as a basis to evaluate the impact of the intervention on team orientation in the subsequent chapter.

4.7 Conclusions

This chapter examined the antecedents of team orientation. The initial step investigated what is meant by teamwork. It was argued that two perspectives are evidenced in the literature; team based working as a structure and team orientation as an individual's attitude toward his/her work group. Subsequently, an hypothesized model containing the antecedents of team orientation was presented. This model was empirically tested using the data from site 1 and site 2.

The results suggest that the significant antecedents consistent between the two sites are factors that are proximal to the individual. Overall, the model provides a useful basis for evaluating the impact of the intervention on team orientation. It is to this we now turn.

Chapter 5: The Impact of a TQM Intervention on Team Orientation

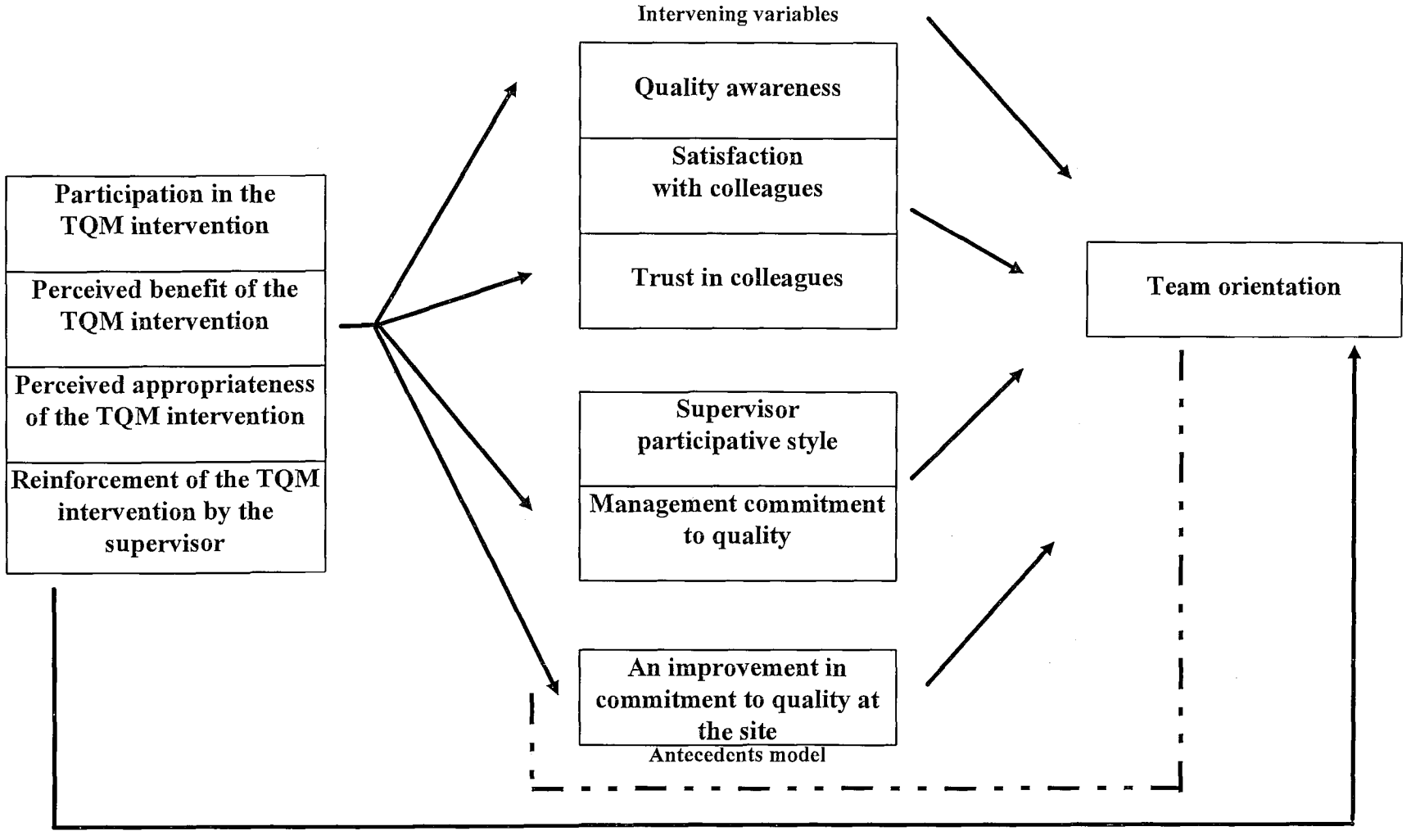
5.1 Introduction

The previous chapter presented and empirically tested an hypothesized model of the antecedents of team orientation. The chapter concluded that the model provided a useful basis for evaluating the impact of the intervention on team orientation. Consequently, this chapter sets out to investigate the total impact, if any, of the intervention on team orientation. Hence, the initial step discusses how the total impact of the intervention will be assessed; that is, the logic underlying the evaluation.

Reflecting its critical importance, the intervention is examined in detail. This involves looking at the different aspects of the intervention and their measurement. Subsequently, the analysis procedures used and the descriptive statistics of the intervention are discussed. This provides an overview of the extent of participation in the intervention as well as how the intervention was assessed along a range of dimensions. Following, the results are presented and discussed.

As discussed in chapter 3, there is a strong argument for assessing the intervention in terms of its total impact on, in this case, team orientation. This involves assessing the direct and indirect effects of the intervention on team orientation. The full evaluation model of the impact of the intervention on team orientation is outlined in Figure 5.1. There are four intervention variables (these are discussed in greater detail in the subsequent section) which tap different aspects of the intervention. The first intervention variables taps employee participation in the intervention. Previous research has indicated that the assessment of training activities may be more important

FIGURE 5.1: Hypothesized evaluation model of the impact of a TQM intervention on team orientation



than participation in affecting subsequent attitudes (Tannenbaum, Mathieu, Salas and Cannon-Bowers, 1991). Consequently, the three remaining intervention variables in the model tap employee assessment of the intervention (perceived benefit and appropriateness) and their perception of the extent to which their immediate boss is committed to and involves employees in the intervention.

In the evaluation model, the antecedents of team orientation from the previous chapter now become the intervening variables. The total impact for each of the four intervention variables on team orientation is assessed. For example, the direct effect of participation in the intervention on team orientation is rigorously determined by controlling for the remaining intervention variables, the intervening variables and a set of demographic control variables. The indirect effects of participation in the intervention on team orientation is assessed through its impact on the set of intervening variables in the model. The direct effect and indirect effects are added to give the total effect of each of the intervention variables on team orientation.

5.2 Measures of the intervention

As mentioned above, the intervention is operationalized as having four components. The first component taps an individual's participation in the intervention while the remaining three components tap different aspects of how individuals assess the intervention. Several points are worth noting on the measures of the intervention. First, to my knowledge, no previously validated measures tapping individuals' perceptions and assessment of a TQM intervention exist. Therefore, the following measures were created for this study. Second, these measures were collected at time 2. Third, as the

measures relate to the TQM intervention, they were collected at site 1 only. Where appropriate the alpha coefficients for the scales are presented.

Participation in the TQM intervention Respondents at site 1 were asked to what extent they were participating in the activities of the TQM intervention. Responses were on a five point Likert scale from not at all to a very great extent. As this is a single item measure a reliability coefficient was not calculated.

Assessment of the TQM intervention Respondents at site 1 were asked questions relating to the intervention along the dimensions of perceived benefit of the intervention, perceived appropriateness of the intervention and supervisory reinforcement of the intervention.

Perceived benefit of the intervention This four item scale taps respondents' perception of the extent to which the intervention is of benefit to them; the extent to which it is part of their job and; the degree to which they think it is a management initiative to get people to do more work. The alpha coefficient for this scale at time 2 was .75.

Perceived appropriateness of the intervention This four item scale measures the degree to which respondents felt the intervention was appropriate, and that it was a priority and of equal benefit to management and employees. The alpha coefficient for this scale at time 2 was .81.

Reinforcement of the intervention by the immediate supervisor This variable measures respondents' perception of the degree to which their immediate supervisor

was committed to and involved them in the intervention. This three item scale has an alpha coefficient of .68 at time 2.

5.2.1 Factor analysis of the items measuring the intervention

Factor analysis (principal components method, varimax rotation) was conducted on all the items measuring perceptions of the intervention. The results indicated a three factor solution with the items tapping whether the intervention improved management-employee relations loading on supervisory reinforcement of the intervention. As an improvement in management-employee relations as a result of the intervention is essentially an outcome of the intervention (and possibly a consequence of supervisory reinforcement of the intervention), a second factor analysis was conducted, forcing the items to load on four factors.[1] The factors and their loadings are presented in Table 5.1.

[1] This step of forcing items to load on a specified number of factors is not uncommon. See for example, Scott and Bruce (1994).

Table 5.1: Factor analysis of the items measuring the intervention

Item	Factor 1	Factor 2	Factor 3	Factor 4
WTTW has resulted in better relations between management and employees	.86°	.26	.19	.23
WTTW has resulted in greater teamwork between management and employees	.82°	.31	.21	.22
WTTW has improved communication between management and employees	.80°	.29	.18	.28
There is a lot of active support among workers in general	.67°	.06	.32	.27
There is no benefit for me in WTTW†	.22	.80°	.12	.22
WTTW is not part of my job†	.07	.79°	.03	.19
WTTW is a management initiative to get people to do more work†	.19	.64°	.27	-.05
WTTW is no better or worse than previous initiatives†	.20	.53°	.23	-.15
WTTW is an appropriate way to bring about the type of change needed	.19	.15	.80°	.02
WTTW will benefit me in my job	.28	.39	.66°	.17
Management and employees will benefit equally from WTTW	.17	.41	.58°	.24
WTTW is a top priority at this site	.23	.19	.53°	.50
There is a lot of active support for WTTW among managers ‡	.29	-.05	.48°	.47
My immediate boss is strongly committed to WTTW	.18	-.03	.26	.79°
My immediate boss involves me in WTTW	.20	.34	-.12	.75°
My immediate boss has changed his/her behaviour as a result of WTTW	.30	.00	.15	.51°
Eigenvalue	6.6	1.69	1.14	1.00
Percent of variance	42.9	10.6	7.1	6.2

° indicates factor on which item loads most highly
† item reversed scored
‡ item dropped as factor loading less than .5

The four factors were labelled as follows: improvement in management-employee relations as a result of the intervention, perceived benefit of the intervention, perceived appropriateness of the intervention and reinforcement of the intervention by the supervisor. The first factor cannot be considered as falling into the category of assessment, it is clearly tapping perceptions linking the intervention to an outcome or consequence, namely, management-employee relations.[2]

Perceived benefit and appropriateness of the intervention are clearly tapping how individuals cognitively assess the intervention. These represent individuals' judgements and inherently their expectations of the intervention. The final factor; supervisory reinforcement of the intervention does not directly tap how individuals assess the intervention. Rather, it taps an individual's assessment of the process of implementation or the cascading of the intervention. In this sense, it taps an assessment of the process rather than an assessment of the intervention per se.

5.3 Analysis procedures

The evaluation model was tested in two stages using the data from site 1. The first stage was to regress the intervening (antecedents from the previous chapter) variables on the intervention variables and control variables at site 1. The second stage was to regress the dependent variable, team orientation, on all the variables in the model. Separate regressions were carried out to obtain the path coefficients (standardized beta) for the two stages of the model. The path coefficients were used to measure the direct, indirect and total effects of the variables in the model. The regressions were carried out

[2] Therefore, it is excluded from the analysis in this and subsequent chapters. However, as it is an outcome of the intervention, it is picked up in Chapter 11 as part of an overall assessment of the impact of the intervention.

on the time 2 and the *change* data. As the *change* data is arguably the more rigorous, greater emphasis will be placed on these results in the discussion.

5.4 Descriptive statistics of the TQM intervention

This section looks in detail at the intervention variables in view of their centrality to the evaluation. As a starting point, the means and standard deviations are presented for the four intervention variables in Table 5.2.

Table 5.2: Descriptive statistics of the TQM intervention variables

	Time 2	
	Mean	**(S.D)**
Participation in the intervention	2.58	(1.15)
Perceived benefit of the intervention	4.20	(1.31)
Perceived appropriateness of the intervention	4.99	(1.26)
Reinforcement of the intervention	4.56	(1.28)

First, participation in the intervention was measured as a continuous variable so that different degrees of participation could be captured. This also provided a way to reflect the complexities of the intervention and was deemed more appropriate than asking respondents if they were participating in the intervention eliciting a 'yes/no' response. To measure the extent of participation, a five point Likert scale was used ranging from not at all to a very great extent.

Individuals who responded in the '*not at all*' or '*not much*' category were aware of the intervention and had received communication about the intervention when it was

launched. In essence, these individuals were not participating in the intervention. 78 out of 165 employees fell into these two categories. In contrast, individuals who responded in the *"to a very great extent"* and *"to a great extent"* had received training by their supervisor and were participating in teams with the aim of making improvements in their work area. 32 out of 165 fell into these two categories. The remaining 55 employees responded in the *"to some extent"* category. These individuals were not participating in teams. Their involvement in the intervention was limited to either being trained in the principles of the intervention by their supervisor or being involved at a more informal level by their supervisor. This could mean that the supervisor has communicated information about the intervention but has not given their employees training or that the employee was doing intervention related activities to assist the supervisor in his/her cross functional or hierarchical team.

In terms of perceived benefit of the intervention, 34.6% of employees thought the intervention was beneficial (mean response of 5.0 or above), 43% of employees did not (to varying degrees) think that the intervention was beneficial (mean response of 3.75 or below) and 22.4% remained relatively neutral on the benefit of the intervention (mean response greater than 3.75 and less than 5.0). A more positive picture emerges from employees' views of the appropriateness of the intervention; 50.9% thought it was appropriate to varying extents (mean response of 5.0 or above), 18.8% did not perceive the intervention as appropriate (3.75 or below) and 30.3% remained relatively neutral on the appropriateness of the intervention (mean response greater than 3.75 and less than 5.0). 43% of employees perceived their supervisor as reinforcing the intervention (mean response of 5.0 or above), 37% did not think their supervisor was reinforcing the intervention (mean response of 4.0 or below) while the remaining 20% did not have a clear view of their supervisor reinforcing the intervention (mean response greater than 4.0 and less than 5.0).

Overall, a varied picture is presented of the intervention in terms of employee participation and assessment. A balanced variation is found regarding employee participation with approximately half of the employees participating to varying extents while the remaining employees are not participating. In terms of employee assessment of the intervention, there is considerable variation between employees. Approximately half of the employees viewed the intervention as appropriate while a third of employees judged the intervention to be beneficial. Just over 40% of employees perceived their supervisor as reinforcing the intervention.

5.5 Results

This section presents the results of the evaluation model of team orientation. Table 5.3 presents the direct, indirect and total effects of the intervention variables on team orientation at time 2.

Table 5.3: Direct, indirect and total effects of the TQM intervention on variables in the model at Time 2

TQM Variables	Sat. with Coll.	Trust in Coll.	Quality aware	Sup. partic. style	Mgt. commit to quality	Improve in commit. to quality	Team orientation
1. Participation in TQM							
Direct Effects on	-.06	-.02	.05	-.01	.05	.04	.13+
Indirect Effects on							-.01
Total Effect							.12
2. Perceived benefit							
Direct Effects on	.00	.00	-.04	.19**	.14**	.24**	-.07
Indirect Effect on							.04
Total Effect							-.03
3. Perceived appropriateness							
Direct Effects on	.11	-.05	.04	-.05	.08	.19**	.09
Indirect Effect on							.00
Total Effect on							.09
4. Supervisory reinforcement							
Direct Effects on	.16+	.30**	.07	.29***	.15**	.21**	.09
Indirect Effect on							.16
Total Effect							.25***
Adjusted R^2	.17	.49	.36	.39	.51	.29	.48
N	165	165	165	165	165	165	165

+ = p<.10 ** = p<.05 *** = p<.01

The results show that participation in the TQM intervention did not have any significant effect on the intervening variables. Furthermore, participation did not have a significant effect on team orientation. Second, it is the assessment of the intervention rather than participation per se that is important in affecting the intervening variables. In particular, supervisory reinforcement of the intervention had a stronger effect on the intervening variables than did the other two assessment variables. Finally, one aspect of the intervention, supervisory reinforcement had a significant total effect on team orientation. In brief, the linkage found between the TQM intervention and team

orientation is an indirect one. It occurs through supervisory reinforcement affecting trust in colleagues and supervisor participative style which in turn affect team orientation.

Table 5.4 presents the direct, indirect and total effects of the TQM variables on *changes* in team orientation between the two occasions of measurement.

Table 5.4: Direct, indirect and total effects of TQM intervention on variables in the model -*change* over time (T2-T1)

TQM Variables	Sat. with Coll.	Trust in Coll.	Quality aware	Sup. partic. style	Mgt. commit to quality	Improve in commit. to quality	Team orientation
1. Participation in TQM							
Direct Effects on	-.10	-.05	.11	-.11	.15	.04	.07
Indirect Effects on							-.02
Total Effect							.05
2. Perceived benefit							
Direct Effects on	.01	-.05	-.09	.19+	.11	.24***	.04
Indirect Effect on							-.01
Total Effect							.03
3. Perceived appropriateness							
Direct Effects on	.10	-.03	-.06	-.17	-.03	.19**	-.04
Indirect Effect on							-.01
Total Effect on							-.05
4. Supervisory reinforcement							
Direct Effects on	.06	.26**	.05	.14	.09	.21**	.09
Indirect Effect on							.13
Total Effect							.22***
Adjusted R^2	.00	.00	.00	.04	.05	.29	.25
N	165	165	165	165	165	165	165

+ = p<.10 ** = p<.05 *** = p<.01

The results of the change analysis confirm the cross sectional results. Participation did not have a significant impact on changes in the intervening or dependent variables. The results confirm the importance of assessment of the intervention over participation in affecting subsequent attitudes. Of the assessment variables, supervisory reinforcement had a significant effect on team orientation. Finally, the same linking mechanism was found between the TQM intervention and *changes* in team orientation.

5.6 Discussion

The impact of the intervention will be discussed in two stages beginning with its impact on the intervening variables and then looking at its impact on the dependent variable.

Intervening variables

Overall, the intervention had some impact on the intervening variables. Of the intervention variables, supervisory reinforcement had the greatest impact. In particular, supervisory reinforcement was found to have a significant effect on variations and changes in trust in colleagues (which subsequently affected team orientation). Previous research has identified three classes of determinants of trust; personality characteristics, interpersonal characteristics and situational features (Golembiewski and McConkie, 1975). It is the latter class of determinant that may help explain why supervisory reinforcement of the intervention would have an effect on trust in colleagues. Golembiewski and McConkie (1975) present three methods which seek to increase trust in organizations; group decision making to reduce mistrust; reorganization of work to encourage integration and collaboration and; efforts to change norms toward greater openness and problem solving. These methods broadly reflect what TQM purports to achieve. The TQM intervention at the work group level is directed toward uniting the

group toward problem solving and collaborative efforts to improve quality. For this to be accomplished, it is necessary for the immediate supervisor to be committed to the intervention and transfer the intervention to the workplace by involving group members. Allowing group members to become involved in the intervention will provide a legitimate forum for greater group interaction, facilitate greater awareness of each individual's role in the group and provide a superordinate goal of continuous improvement that requires collaboration among members. As a result, one would expect positive changes in trust in colleagues.

Two aspects of the intervention have a significant impact on supervisor participative style. First, supervisory reinforcement has a significant positive effect. The explanation is straightforward as supervisors who are reinforcing the intervention are involving subordinates in the intervention and thus facilitating their participation. Consequently, it is not surprising that individuals who perceive their immediate boss as reinforcing the intervention are more likely to see their immediate boss as participative.

Second, individuals who perceive the intervention as providing some benefit to them are more likely to perceive their supervisor as participative. As mentioned earlier, an assumption underlying this chapter is that the four TQM intervention variables are exogenous in relation to the other variables in the model. In this case, however, the direction of causality is less clear; that is, supervisor participative style prior to the intervention may be a significant factor in influencing an individual's assessment of the intervention. Taking this further, it is quite likely that participatively oriented supervisors prior to the intervention are more likely to communicate information regarding the intervention to subordinates which consequently shape their assessment of the intervention. The importance of supervisors as providers of social information has previously been highlighted (Griffin, 1983). Thus, rather than perceived benefit

affecting supervisor participative style, the direction of influence may be in the contrary direction. This issue is pursued in greater detail in chapters 8 and 9.

The impact of supervisory reinforcement on perceived management commitment to quality highlights the saliency of the immediate boss. Leadership behaviours are likely to be interpreted as representative of the wider organization (Kozlowski and Doherty, 1989) and thus individuals are likely to attribute supervisory behaviour to management. This linkage may be reciprocal as management actions and policies are likely to have an effect on supervisory behaviour. Thus, supervisors reflect management actions, policies and procedures.

The intervention had no significant impact on one of the intervening variables, quality awareness. One explanation for the lack of change in quality awareness over time may be the use of an insensitive instrument. The quality awareness scale yielded responses toward the top end of the scale indicating the potential operation of social desirability. The distribution and standard deviation (around 0.65) would support this. Differences in quality awareness across job titles provides counter support to the insensitivity argument. A more plausible explanation is that the intervention did not provide a convincing rationale that there was a real need to improve the awareness of one's own actions and their consequences.

Team orientation

Turning now to the impact of the TQM intervention on team orientation, two main findings stand out. First, the intervention did not have a significant **direct** impact on team orientation. Thus, none of the intervention variables had a significant direct effect on *changes* or variations in team orientation. However, the intervention did have a significant total effect on team orientation. In particular, supervisory reinforcement of

the intervention had a significant impact on an individual's trust in their colleagues which had a significant effect on team orientation. The nature of these linkages have previously been discussed.

Second, and more generally, the results suggest that the assessment of the intervention is a better predictor of changes in the intervening and dependent variables than participation in the intervention per se which was not found to have a significant effect on any of the variables in the model. The importance of individual reactions to the intervention is consistent with previous research on training which suggests that participation in training activities is not sufficient to bring about attitudinal and behavioural change. Rather, it is training fulfilment that played a central role in the development of posttraining attitudes. (Tannenbaum, Mathieu, Salas and Cannon-Bowers, 1991).

It is also in line with research on Quality Circles (QCs), which hints that employee reactions to QC activities may play a central role in explaining the development of subsequent attitudes. For example, Griffin (1988) found that positive effects of participation in QCs (job satisfaction and organizational commitment) were evidenced in the initial 18 month period of QC operation. However, these positive effects subsequently declined to the baseline level. While the author did not measure employee reactions to or assessment of QCs, he offers some possible explanations for the decline in positive effects, one of which is the perceived decline in management support by QC participants. Bruning and Liverpool (1993) found that participation in QCs was not a significant predictor of outcome variables; respondents failed to show more positive outcomes if they were members of QCs. Similarly, the authors did not include measures tapping employee evaluation of QCs. They, however, suggest that management attitudes toward QCs could affect an individual's experience of QC

activities. Thus, for example, participants' assessment of the support received from management for QCs may be an important factor in explaining the lack of predictive power of participation *per se* .

Most notably, the results presented here stress the importance of reactions to the intervention in predicting subsequent attitudes. How employees react and what predicts how they react is investigated in a subsequent chapter. If these findings are broadly correct, they have important implications for evaluating employee participation programs.

Participation in the intervention

The lack of predictive power of participation in the intervention on subsequent attitudes is interesting in view of the considerable emphasis placed on participation per se in TQM and QC research. A number of explanations are offered for this finding. First, it is possible that participation in the intervention may not have matched pre participation expectations thus having no effect or a damping effect on subsequent attitudes. This is partly conjectural as the questionnaire did nor include items tapping met expectations but from interviews at the site it was noted that the intervention was launched in quite a dramatic fashion but it took considerable time for the training to be completed and the mechanisms to be set up. This would lend support to high expectations being created at the launch of the programme which were not met during the initial period.

Second, much of the literature on Total Quality and Quality Circles stresses the voluntary nature of employee participation. In practice, little is known about the extent to which individuals are put under pressure from peers and/or their immediate boss to participate. The extent to which an individual feels under pressure to participate may explain the lack of change in subsequent attitudes. A final point that may shed light on

the poor predictive effect of participation has to do with the time span of the study. It may be the case that the lapse of time between an individual's participation and the collection of attitudinal data was not long enough to reasonably expect participation to have an impact. Griffin (1988) in his longitudinal study of QCs allowed six months to lapse between the baseline questionnaire and the first questionnaire after the commencement of QCs. This time span is not uncommon in the initial stage of the evaluation of change (see Wall et al. (1986) for an initial measurement 6 months after the commencement of AWGs). It may be the case that in the longer term as the intervention develops and takes root, participation may have a greater predictive power than the assessment of the intervention. Further research is needed to assess the impact of different time lags on the predictive power of participation in TQM interventions on subsequent attitudes

Decrease in team orientation

So far, the discussion has focused on how the TQM intervention has had an impact on team orientation. The intervention had a significant total effect on team orientation. The final issue that needs to be addressed is why the mean score of team orientation for the employee sample as a whole has decreased (10% significance level) between time 1 and time 2.

A possible explanation may be that other changes may have affected team orientation in a negative way. The major change that occurred at site 1 was the TQM intervention. From my knowledge, there were no changes within the site that would have had a negative impact on team orientation. Second, at the level of the work group, one may argue that movement of individuals between different work groups may have affected team orientation. This may be eliminated as an explanation as there was a negligible movement of individuals between different work areas so individuals would have the

same colleagues at time 1 and time 2. It may be worthwhile reverting attention to the TQM intervention in order to explain why a decrease in team orientation occurred in the intervening period.

In pursuing this possible route, it may be beneficial to assess whether a particular group of employees can be identified whose team orientation shifted in a negative direction. To explore this further, the sample was divided into two subgroups; participants and non participants in the TQM intervention. Paired sample t-tests were conducted for the two groups on team orientation. The results showed that over time, team orientation remained unchanged for participants (5.93 at time 1 and 5.90 at time 2). What is interesting is that team orientation has shifted in a negative direction for non participants (5.51 at time 1 and 5.28 at time 2, significant at the 5% level). While these results are important in attempting to identify why team orientation has decreased, they do not indicate that participation is an important predictor of team orientation as no other variables are controlled for. What the results allow is a greater accuracy in pinpointing the group of individuals for which team orientation has decreased. Why would team orientation decrease for non participants?

It would seem that a negative reaction has occurred in the group of individuals who have not participated in the TQM intervention. This may be a consequence of raised expectations followed by disillusionment when expectations are not met. Bennis (1977) argues if changes interventions are badly managed, they may have negative rather than the desired positive consequences. There are implications for managing TQM change interventions. From an implementation stance, it may be important to plan a rapid diffusion of the program throughout the organization. This would be consistent with the recommendation of Graham and Verma (1991) that there is a need to manage "proximity" to ensure positive affect toward employee participation

programs. The decrease in team orientation may be a short term effect reflecting a feeling of being "left out" of the intervention which will dissipate once the intervention has diffused more widely.

To the extent that one can argue that non participants have reacted in a negative manner, this points to a diffusion problem. However, a more serious issue is that participants have not significantly changed their team orientation. In order to put forward a possible explanation for this finding, it is necessary to look at the perceptions that participants hold regarding their immediate supervisor's reinforcement of the intervention. Thus, if supervisors diffuse the intervention (involving subordinates in the intervention) and are visibly committed to it, one would expect that participants would report their supervisors as reinforcing the intervention. Looking at the group of participants, 51.6% report that their supervisor is reinforcing the intervention (mean score of 5.0 or above) while 17.2% report that their supervisor is not reinforcing the intervention (mean response of 4.0 or below). The remaining 31.2% remain relatively neutral on their supervisor reinforcing the intervention.[3]

What this may suggest is that approximately half of the participants perceive their supervisor as committed to and supportive of the intervention. Consequently, employee participation in the intervention does not necessarily mean that their supervisor is committed to the intervention. In essence, a fine distinction is necessary between what may be supervisor compliance (involving subordinates in the intervention) and supervisor commitment (not only involving subordinates but also supporting and reinforcing the intervention). The fact that nearly half the participants do not report their supervisor as positively reinforcing the intervention may help explain why team orientation has not significantly changed in a positive direction.

[3] For non participants, 17.7% report their supervisor as reinforcing the intervention while 59% report their supervisor as not reinforcing the intervention.

5.7 Conclusions

This chapter assessed the impact of a TQM intervention on team orientation. The impact of the TQM intervention on team orientation was found to be an indirect one. The linkage occurred through supervisory reinforcement of the intervention which affected trust in colleagues which in turn affected team orientation.

The results highlighted that participation in the intervention per se was not a sufficient condition to affect subsequent attitudes. Rather, the significant aspect of the intervention was employee perception of the extent to which their immediate boss reinforced the intervention. However, team orientation shifted significantly in a negative direction for non participants and remained unchanged for participants between time 1 and time 2. A potential explanation put forward was the lack of supervisory reinforcement in terms of involving employees which resulted in a feeling of being 'left out' by non participants. Regarding participants, even though they are participating in the intervention, nearly half did not perceive their supervisor as positively reinforcing the intervention. This would seem to indicate that employee participation in the intervention does not automatically mean that the supervisor is reinforcing the intervention. A supervisor may comply by involving subordinates in the intervention but this does not mean that the supervisor supports and reinforces the intervention.

Does the intervention have a similar impact on the other key expected outcomes of TQM? The next two chapters address this question in two stages. The first stage examines the concept of commitment to improvement itself and assesses its similarity to intrinsic motivation. The second stage (chapter 7) involves assessing the impact of the intervention on these concepts.

Chapter 6: Commitment to Improvement and Intrinsic Motivation: The Same Constructs?

6.1 Introduction

The previous chapter investigated the impact of a TQM intervention on team orientation. The results showed that the impact was indirect; that is, supervisory reinforcement of the intervention had a significant effect on trust in colleagues, which in turn, had a significant influence on team orientation. This raises the question of whether the effect of the intervention on team orientation is mirrored for other core elements of TQM. Therefore, this line of investigation continues and assesses the impact of the intervention on commitment to improvement and intrinsic motivation.

Several concepts such as commitment to quality, commitment to continuous improvement and intrinsic motivation are widely used in the literature in what seems to be an interchangeable manner. On one hand, Deming (1986) Crosby (1986) and Dale and Cooper (1992) place great emphasis on motivation. They argue that employee demotivation is a result of primarily management practices. The prescription is quite clear; by changing management practices through adopting and pursuing TQM, employees will experience greater motivation. Here, the underlying assumption is that employees are in fact motivated and want to do a good job, if this does not occur, there is a strong likelihood that the reason is due to management practices. Juran (1989) and Wilkinson (1992) argue that by giving employees responsibility for the quality of their work, this will improve their motivation. Feigenbaum (1983) uses the term commitment to quality to capture what seems to be an orientation to doing a quality job.

More recently, the term empowerment has entered into the TQM arena (Grant et al., 1994; Cruise O' Brien, 1995). The term has its origins outside TQM (Bennis and Nanus, 1985; Burke, 1986) and has been interpreted in a variety of ways, for example, to describe specific interventions as well as the presumed effects of these interventions on employees (Conger and Kanungo, 1988). It has been recommended that empowerment be defined in terms of motivational processes; that is, an increase in workers' effort - performance expectancies (Conger and Kanungo, 1988, p475) or increased task motivation (Thomas and Velthouse, 1990). In this light, TQM interventions may be viewed as empowering through managerial actions to remove obstacles that muddy the link between effort and performance thereby increasing intrinsic motivation. In this sense, empowering is the act of taking away demotivators (Perisco, 1991).

In addition some writers emphasize continuous improvement rather than motivation. Hill (1991b) states that one element of a quality culture is the *'internalization of quality and continuous improvement as the goal of all activities'* (p555). In more recent contributions (Waldman, 1994; Sitkin et al, 1994), the importance of continuous improvement as a key outcome of TQM is reinforced. Emphasizing this perspective, the notion of continuous improvement is akin to innovation; problem recognition, generation of new ideas or solutions, sponsorship of the new idea and the institutionalization of the new idea (Scott and Bruce, 1994; Kanter, 1988). Lawler (1994) hints at the distinctiveness of intrinsic motivation and continuous improvement. He argues that employees have responsibility in two areas: calling attention to quality problems as they do their normal work and accepting the continuous improvement culture by looking for ways to improve how they do their work and ways to improve the overall activities of the organization. The former area of responsibility can be thought of as intrinsic motivation; that is, the desire to do a good job and the

notification to management of barriers to accomplishing this. The latter may be thought of as commitment to improvement.

In view of the parallel usage of intrinsic motivation and commitment to continuous improvement, the distinction (or lack of) between the concepts warrants investigation. Prior to assessing the impact of the intervention on commitment to improvement and intrinsic motivation, it is necessary to assess whether these two concepts are indeed conceptually similar and thus interchangeable. Consequently, the aim of this chapter is to examine the two concepts thus providing the basis for investigating the impact of the intervention on intrinsic motivation and commitment to improvement in the subsequent chapter. In addition, a secondary aim of the chapter is to present and test a model of commitment to improvement.

To my knowledge, there has been little attempt to operationalize commitment to improvement. The chapter begins by proposing a definition of commitment to improvement. This provides a starting point for examining its similarity with intrinsic motivation. Factor analysis is used to examine the nature of the underlying constructs being measured by the two concepts. A model of commitment to improvement is then presented. The second stage of the investigation uses the model to assess the degree of commonality between the two concepts in relation to their predictors.

6.2 Commitment to improvement

This section discusses the nature of commitment to improvement and a definition is proposed. Following this, the items measuring commitment to improvement are factor analysed to assess the dimensionality of the concept. This provides the basis for the

initial assessment of the conceptual similarity of commitment to improvement and intrinsic motivation.

The concept of continuous improvement is a key component of TQM. In the context of TQM, work performance defined in terms of in-role behaviour (Campbell, 1990) may not be wholly appropriate (Waldman, 1994) to a TQM culture. Individuals are expected to accomplish their formally defined tasks, directing attention to obstacles that prevent such accomplishment. They are also required to think about ways of how they can improve the way they do their job, the work of their group and overall activities of the organization. Thus, commitment to improvement goes beyond an individual doing the best job they can, it requires an individual to generate ideas for improvement and take action on those ideas.

6.2.1 Definition of commitment to improvement

Commitment to improvement is defined as an individual's internalization of continuous improvement and a willingness to exert effort to find ways to prevent mistakes and make improvements. It is viewed not only in terms of attitude but also in terms of behaviour. In addition, commitment to improvement is hypothesized to have two components; general orientation to quality and improvement as part of the job. This definition does not include an individual's receptivity to improvement ideas coming from others which arguably may be another dimension of commitment to improvement.

The first component of commitment to improvement is labelled a general orientation to quality and was measured by four items in the questionnaire:

- In my work area, I am always looking for ways to prevent mistakes

- I have put a lot of effort into thinking about how I can improve my work
- To know I had made a contribution to improving things around here would please me
- I am strongly committed to Total Quality

The first two items reflect the behavioural dimension; that is, an individual's willingness to look for ways to prevent mistakes in the work area and an individual's willingness to exert effort in looking for ways to improve his/her job. The latter two elements represent a general affective orientation to quality and improvement.

The second component is labelled improvement as part of the job. This reflects a greater internalization of improvement; that is, an individual feels that looking for improvements is an inherent part of their job. It was measured with the following three items:

- Looking for ways of improving how things are done around here is part of my job
- I am not paid to think of ways of improving things around here
- I often put forward ideas and suggestions without expecting extra reward

The first two items tap an affective dimension, the extent to which improvement is considered part of the job and the extent to which individuals think they are paid to think of ways to contribute to improvements. The last item taps behaviour, the extent to which an individual puts forward ideas and suggestions without expecting extra reward.

6.2.2 Factor analysis of commitment to improvement

Factor analysis (principal components method, varimax rotation) was conducted on the seven items measuring commitment to improvement at time 2 using the combined site 1 and site 2 sample. The results revealed two factors which may be thought to relate to degrees of commitment to improvement and reflect the two components identified above; general orientation to quality and improvement as part of the job. These factors are displayed in Table 6.1.

Table 6.1: Factor analysis of items measuring commitment to improvement

Item	Factor 1	Factor 2
I am strongly committed to Total Quality	.80°	.02
To know I had made a contribution to improving things around here would please me	.73°	.21
In my work area I am always looking for ways to prevent mistakes	.68°	.21
I have put a lot of effort into thinking about how I can improve my work	.60°	.42
Looking for ways to improve how things are done is part of my job	.22	.78°
I am not paid to think of ways of improving things†	.12	.72°
I often put forward ideas and suggestions without expecting extra reward	.14	.67°
Eigenvalue	2.88	1.02
Percent of variance	41.2	14.7

° indicates factor on which item loads most highly
† item reversed scored

The results of the factor analysis were replicated using the data from the individual site samples (Appendix 10 and 11). This provides support for treating commitment to improvement not as a unidimensional concept but as having two distinct dimensions. The two dimensions may be thought of as levels of commitment to improvement; general orientation to quality being easier to affect than improvement as part of an individual's job. In view of these two dimensions, the model outlined later will be tested separately on general orientation to quality and improvement as part of the job.

6.3 Intrinsic motivation: A different construct?

Having established that commitment to improvement is comprised of a general orientation to quality and improvement as part of the job, the next step is to examine at a conceptual level potential differences between these two concepts and the notion of intrinsic motivation. One could argue that all three concepts are measuring an underlying desire to perform well; that is, an individual's desire to do the best possible job he/she can. However, it is plausible that the three concepts are tapping related but distinct constructs. For example, intrinsic motivation taps the degree to which an individual wants to work well in his/her job in order to achieve intrinsic satisfaction. In contrast, improvement as part of the job focuses on the degree to which an individual feels that looking for improvements is an integral part of their job. Consequently, it could be argued that both of these concepts are tapping particular orientations toward the job. This is where the similarity ends; intrinsic motivation focuses on performance to achieve intrinsic satisfaction. Improvement as part of the job differs from intrinsic motivation in two important respects. First, it focuses exclusively on the degree to which an individual feels that looking for improvements is an integral part of their job and second, it does not propose that an individual wants to make improvements in order to experience intrinsic satisfaction.

A general orientation toward quality may be more conceptually similar to intrinsic motivation than improvement as part of the job. However, intrinsic motivation clearly focuses on the job the individual is doing, general orientation to quality is not job specific. It taps an individual's willingness to prevent mistakes and contribute to improvements not just in their job but in their work area as well.

The possibility that commitment to improvement and intrinsic motivation are conceptually distinct has been raised. Consequently, the next step would be to test this proposition empirically using the data from the two sites. To do this, the items measuring commitment to improvement and intrinsic motivation were factor analysed together. Intrinsic motivation was measured using Warr, Cook and Wall's (1979) six item scale. The results of the factor analysis using principal components and varimax rotation for the combined site 1 and site 2 sample are shown in Table 6.2.

Table 6.2: Factor analysis of items measuring intrinsic motivation and commitment to improvement

Item	Factor 1	Factor 2
I take pride in doing my job as well as I can	.80°	.12
I feel unhappy when my work is not up to my usual standard	.79°	.08
I feel a sense of personal satisfaction when I do this job well	.77°	.21
I try to think of ways of doing my job effectively	.74°	.27
I like to look back on the day's work with a sense of a job well done	.72°	.23
My opinion of myself goes down when I do this job badly	.64°	-.05
To know I had made a contribution to improving things around would please me	47°	.47
I am strongly committed to Total Quality	45°	.38
Looking for ways to improve how things are done is part of my job	.12	.75°
I am not paid to think of ways of improving things†	-.02	.70°
I often put forward ideas and suggestions without expecting extra reward	.04	.64°
Put a lot of effort into thinking about how I can improve my work	.37	.59°
Always looking for ways to prevent mistakes	.41	.45°
Eigenvalue	5.13	1.60
Percent of variance	39.5	12.3

° indicates factor on which item loads most highly
† item reversed scored

The results indicate the presence of two factors that broadly correspond to commitment to improvement and intrinsic motivation. However, two items of general orientation to quality have relatively similar loadings on factor 1 and 2. If one looks at the results of the factor analysis for the individual site samples (appendix 12 and 13), then intrinsic motivation and commitment to improvement were found to be factorially independent. However, commitment to improvement was not found to have two factors corresponding to the components outlined previously. This questions the factorial independence of general orientation to quality and improvement as part of the job. In view of the aim of this chapter; to assess the conceptual similarity of commitment to improvement and intrinsic motivation, it is worthwhile treating the two components of commitment to improvement as independent so that any conceptual similarity found to intrinsic motivation can be more accurately attributed to one or the other dimension of commitment to improvement.

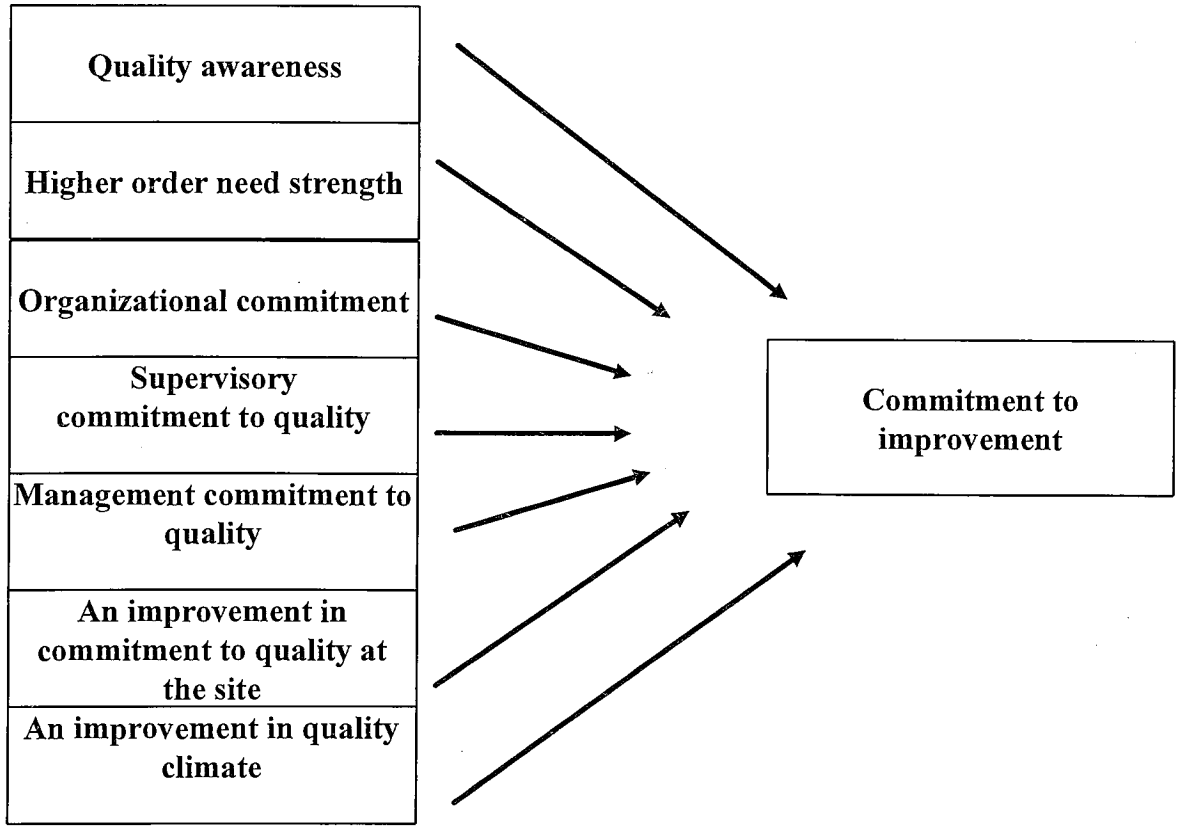
Overall, the results of the factor analysis broadly support commitment to improvement as being a different concept from intrinsic motivation. The next step involves comparing the antecedents of general orientation to quality, improvement as part of the job and intrinsic motivation. In order to do this, a general model of commitment to improvement is first presented. This model is then tested in relation to the three concepts separately. This will allow a comparative assessment of the degree of similarity in the antecedents of the three concepts.

6.4 The antecedents of commitment to improvement

The hypothesized model containing the antecedents of commitment to improvement is outlined in Figure 6.1. Commitment to improvement is viewed as an outcome of three systems; individual, leader and organizational. At the individual level, attitudes toward quality, work and the organization are hypothesized to positively affect an individual's commitment to improvement. The antecedents in the leader category include the attitudes and behaviour of the immediate supervisor as well as that of management which are hypothesized to positively impact an individual's commitment to improvement. Finally, the climate of the organization is hypothesized to affect an individual's commitment to improvement. The predictors are now discussed in greater detail.

Individual level factors. There are three individual level factors which are hypothesized to have an impact on commitment to improvement. These are quality awareness, higher order need strength and organizational commitment. Quality awareness, which as we saw in chapter 4, refers to individuals' awareness of the consequences of their own actions and the importance they assign to their own work and to continuous improvement for the success of the organization, is hypothesized to have a positive impact on commitment to improvement. The rationale is similar to that of task significance in work redesign (Hackman and Oldham, 1980). Task significance is the extent to which a job has impact on people in the immediate organization or in the world at large (p78-79). In a TQM setting, this would involve an awareness that one's own actions (i.e. the quality of work) will have implications for others. Hackman and Oldham (1980) hypothesize that task significance, in addition to two other job characteristics, will lead to high internal work motivation.

FIGURE 6.1 : Hypothesized model of the antecedents of commitment to improvement



Most of the research on higher order need strength has been based on the nature of its effect, that of moderating the relationship between the design of work and outcomes such as motivation and satisfaction (Berlinger, Glick, and Rodgers, 1988; Hackman and Oldham, 1980; Spector, 1985). The underlying premise is that individuals with high levels of higher order need strength are more likely to experience increased motivation, satisfaction and performance from jobs high in scope. In a similar vein, Rafaeli (1985) suggests that growth need strength may moderate employees' reactions to quality circle activities. There is mixed evidence for higher order need strength as a moderator (Spector, 1985). In the present model, higher order need strength is treated as a positive predictor of commitment to improvement. In other words, individuals who have a high need for achievement and satisfaction through work are hypothesized to be more likely to be committed to improvement. This is based on the assumption that engaging in continuous improvement is a source of satisfaction and achievement for individuals.

There is a growing body of literature that suggests that organizational commitment per se is a desirable outcome. Taking this further, one could argue that individuals who are strongly committed to the organization are more likely to accept the goals of the organization and exert effort to attain those goals. Thus, if the organization has as its goal continuous improvement, highly committed individuals are more likely to be committed to continuous improvement. There is some evidence that committed individuals are more likely to engage in extra role behaviours such as creativity and innovation (Katz and Kahn, 1978). Kanter (1968) suggests that commitment translates into greater efforts by workers. In a similar vein, Eisenberger, Fasolo and Davis-LaMastro (1990) found that perceived organizational support from the organization was positively related to organizational commitment and employee innovation (suggestions for improving organizational operations). The authors argue that the results suggest

that citizenship behaviour is a consequence, partly, of an affective attachment to the organization which is consistent with previous research (Brief and Motowidlo, 1986; Organ, 1988). In line with the above arguments, organizational commitment is hypothesized to have a positive impact on individuals' commitment to improvement.

Leader level factors. The next two predictors relate to the attitudes and behaviour of leaders; management and the supervisor. In the TQM literature, great emphasis is placed on management commitment to quality as the mechanism for instilling quality values and behaviours throughout the organization (Deming, 1986; Feigenbaum, 1983; Hill, 1991b; Waldman, 1994). In Crosby's (1986) view, *"....the attitude of employees is a clear result of what they see in the attitude of senior management"* (p. 196). Similarly, Dale and Cooper (1992) argue that senior management is responsible for the *"organizational culture, behaviour, values, climate and style of management in which TQM will either flourish or wither"* (p. 43). Cultural change is the objective of TQM (Hill, 1991b; Wilkinson, 1994) and management has a key role to play in affecting culture change (Schein, 1985). One mechanism for transmitting culture is the actions of leaders, *"what leaders pay attention to, measure and control"* (p.225). Thus, the greater the perceived management emphasis on quality and continuous improvement, the greater the commitment to quality and continuous improvement amongst organizational members.

Supervisory commitment to quality is included in this model in addition to management commitment to quality for two reasons. First, previous research has argued that supervisors are the most salient representatives of management actions, policies and procedures (Kozlowski and Doherty, 1989). Second, the concept of psychological proximity, from field theory (Lewin, 1943) is relevant. The basic premise is that factors more proximal in the work environment should influence an individual's

reactions more immediately than factors more removed from the individual. Scott and Bruce (1994) found that supervisory expectations regarding subordinate innovation were positively correlated to subordinates' innovative behaviour. The authors argue that this was due to the presence of the "Pygmalion effect" (Livingston, 1969). The Pygmalion effect refers to the modification of a focal individual's behaviour based on the expectations for that behaviour received from another (Eden, 1984). Expectations of subordinate behaviour are communicated to them through supervisory behaviour. Consequently, the quality oriented behaviour of the supervisor will shape the quality behaviour of subordinates. Therefore, these perspectives would suggest that the immediate boss will be more salient than management as a group in influencing subordinate commitment to improvement.

Third, the focus of TQM writings on senior leadership implies that transactional leadership theory which emphasizes the work group level, is unimportant to TQM (Dean and Bowen, 1994). Within the context of TQM, Dean and Bowen (1994) argue that far less importance is attached to the role of leadership further down the hierarchy. Therefore, perceived management commitment to quality and supervisory commitment to quality are included to investigate which has a greater impact on individual commitment to improvement.

Organizational level factors. The final two hypothesized predictors are perceptions of climate: an improvement in quality climate and commitment to improvement at the site. The concept of climate has its roots in Lewin's (1951) field theory and later formed the foundation of the early work of Human Relations. It has been defined as sets of perceptually based descriptions of relevant organizational features, events and processes (James and Jones, 1974; Jones and James, 1979). Perceptions of climate mediate the relationship between organizational context and individual responses,

providing a basis for behaviour and affect (Schneider, 1983a, 1983b). Early theorists (Blake and Mouton, 1964; Likert, 1967) regarded leadership as an important factor in affecting climate perceptions. Contemporary research (Kozlowski and Doherty, 1989) has found that leader-subordinate interaction mediates and structures subordinate interpretations of climate. The authors due to the cross sectional nature of their data did not examine the possibility of reciprocal linkages nor did they link climate to individual behaviour. However, Scott and Bruce (1994) found that perceived organizational support for innovation was positively related to individual innovative behaviour. Here, we hypothesize that the degree to which organizational members perceived an improvement in quality climate and commitment to improvement would affect their commitment to quality and improvement.

6.5 Measures

As indicated in the previous chapter, where possible, previously validated measures were used. This section presents the additional measures used in the analysis that have not been previously discussed. The alpha coefficients are given for the combined site 1 and site 2 sample.

It is important to note that the questions tapping general orientation to quality and improvement as part of the job were asked only at time 2. However, in order to assess change over time, respondents were asked to give their response to a particular item and then asked to think back a year prior and asked how they think they would have responded to the same item.

A general orientation to quality This four item scale, as we have seen, taps an individual's willingness to exert effort to prevent mistakes and search for

improvements. This scale has an alpha coefficient of .70 retrospective for time 1 and .71 at time 2.

Improvement as part of the job As already noted, this three item measure taps the degree to which individuals feel improvement is part of their job. The alpha coefficient for this scale was .61 retrospective for time 1 and .60 for time 2.

Intrinsic motivation This is a six item scale developed by Warr, Cook and Wall (1979). This scale taps the degree to which a person wants to work well in his/her job in order to achieve intrinsic satisfaction. The alpha coefficients for this measure were .77 at time 1 and .84 at time 2.

Higher Order Need Strength This five item scale was developed by Warr Cook and Wall (1979) to tap an individual's need for satisfaction and achievement through work. The construct is conceptually distinct from intrinsic motivation which refers to a specific job situation while this scale is viewed as a dispositional characteristic extending across jobs. This scale was found to be factorially independent from the scale measuring intrinsic motivation. The alpha coefficient for this measure was .83 at time 1 and .84 at time 2.

Organizational commitment This six item scale was adapted from Cook and Wall's (1980) nine item measure. The three items that were omitted were negatively phrased. Previous analysis of the scale has shown the six item version to be psychometrically superior (Peccei and Guest, 1993). The measure contains two items that tapped each of the three components of organizational commitment; (i) identification: pride in the organization and internalization of the goals of the organization; (ii) involvement; willingness to exert effort on behalf of the organization

and; (iii) loyalty; attachment to the organization and a desire to remain in the organization. The scale exhibited high levels of reliability at time 1 and time 2, .83 and .84 respectively.

Supervisor commitment to quality This six item measure taps respondents' perceptions of their immediate supervisor's commitment to quality. Two items tap the extent to which an individual perceives his/her immediate boss to be committed to improving quality and setting an example of quality performance in their work. The remaining four items tap an individual's perception of the quality orientated behaviour of the immediate boss; the degree to which the immediate boss facilitates quality work and encourages improvements. The alpha coefficients for this scale was .89 and .87 for time 1 and time 2.

Improvement in quality climate This eight item scale taps respondents' assessment of whether there has been an improvement in quality climate at the site. This measure has three components. The first component taps the degree to which top management is perceived to be more committed to Total Quality and more supportive of suggestions for improvement. The second component taps respondents' perceptions of Total Quality having a greater priority, of progress being made in improvement and of the extent to which individuals are encouraged to voice improvement ideas at the site. The last component taps management employee relations; that is, the degree to which individuals perceive greater contact, communication and co-operation between management and employees. This variable was found to be factorially distinct from improvement in commitment to quality at the site. The alpha coefficient for this scale at time 2 was .93.

6.6 Analysis procedures

As noted above, in attempting to measure change in commitment to improvement, respondents were asked to give their view on an item of commitment to improvement and directly following, they were asked how they would have responded to the same statement a year ago. Arguably, this retrospective method of assessing change is subject to a host of biases and the operation of social desirability; not wanting to be seen as less committed to improvement in the past. Also, this method of assessing change is not as methodologically rigorous as independent measurements at two points in time. This raises the question of whether this type of data (an independent measurement at one point and a retrospective measurement to a previous point in time) can be used to represent change that has occurred over time. The first step in the analysis is to assess the appropriateness of using these data to measure change over time.

6.6.1 Measurement of change using retrospective data

An initial starting point would be to look at the means and standard deviations of the two components of commitment to improvement and compare them to other similar conceptual measures gathered independently at time 1 and time 2. Table 6.3 shows the means and standard deviations for general orientation to quality, improvement as part of the job, intrinsic motivation, higher order need strength and organizational commitment using the combined sample from site 1 and site 2.

Table 6.3: Means and standard deviations of general orientation to quality, improvement as part of the job and conceptually similar measures

(N=444)	Time 1 Mean	(S.D)	Time 2 Mean	(S.D)
General orientation to quality	5.70	(0.77)	5.76	(0.76)
Improvement as part of the job	4.94	(1.25)	4.97	(1.26)
Intrinsic motivation	6.16	(0.64)	6.15	(0.72)
Higher order need strength	5.92	(0.77)	5.93	(0.82)
Organizational commitment	5.24	(1.03)	5.24	(1.09)

From this, we can see that general orientation to quality and improvement as part of the job do not elicit as much social desirability as intrinsic motivation and higher order need strength. Furthermore, the standard deviations for general orientation to quality and improvement as part of the job are at least comparable at both time periods to that of intrinsic motivation and higher order need strength. For improvement as part of the job, the standard deviations are comparable to that of organizational commitment. Consequently, these results support the retrospective measure of commitment to improvement as being as sensitive to comparable measures in picking up variations between individuals.

The next criteria would be to look at the sensitivity of commitment to improvement at picking up changes between time 2 and retrospective to time 1. Again, it is necessary to compare the results to independent measures at time 1 and time 2 of similar concepts.

For the overall sample, 39.6% of respondents felt less intrinsically motivated at time 2, 20.3% of respondents felt no change in their intrinsic motivation and 40.1% of respondents felt more intrinsically motivated. With regard to changes in higher order need strength, 37.4% of respondents reported less need for satisfaction and achievement

through work, 20.7% of respondents felt no change and 41.9% reported a greater need for satisfaction and achievement through work. 13.1% of respondents reported less general orientation to quality, 61.7% reported no change while 25.2% reported increased general orientation to quality. Regarding improvement as part of the job, 11.5% of respondents felt that improvements were part of their job to a lesser extent, 71.6% reported no change while 16.9% reported a more positive view of improvements as part of the job. These results suggest that the retrospective measures of general orientation to quality and improvement as part of the job may not be as sensitive as comparable independent measures at time 1 and time 2 in picking up changes over time.

The intercorrelations between time 1 and time 2 confirm the problematic nature of using retrospective questions to assess change. The intercorrelations over time for intrinsic motivation, higher order need strength and organizational commitment are .59, .47 and .60 respectively. Over time, general orientation to quality has a very high intercorrelation of .79 while the intercorrelation for improvement as part of the job is even higher at .92. Based on the high intercorrelations of general orientation to quality and improvement as part of the job in comparison to the intercorrelations of other measures, the results of the analysis using the change data needs to be interpreted with caution. This does not apply to changes in intrinsic motivation. Consequently, in the discussion, greater weight will be placed on the cross sectional time 2 results.

The general model of commitment to improvement outlined previously was used to examine the antecedents of general orientation to quality, improvement as part of the job and intrinsic motivation using Ordinary Least Squares (OLS) regression. The three dependent variables were regressed separately on the antecedents and the usual set of control variables using the cross sectional time 2 data and the change data. The results

will show the significant antecedents of the three concepts in addition to assessing the reasonableness of the model for its use in the subsequent chapter.

6.7 Results

The results are presented for site 1 followed by the results for site 2. For ease of clarity only the standardized beta coefficients for the significant predictors from the model are shown. In light of the previous discussion on the measurement of change, greater emphasis is attached to the cross sectional results.

6.7.1: Site 1 results

Table 6.4 presents the significant antecedents of the three dependent variables: general orientation to quality, improvement as part of the job and intrinsic motivation.

Table 6.4: The impact of the antecedent variables on the three dependent variables at time 2- site 1

Antecedent variables	General orientation to quality	Improvement as part of the job	Intrinsic motivation
Management commitment to quality			
Supervisor commitment to quality			
Organizational commitment	.17***	.18***	.23***
Higher order need strength	.16***		.26***
Quality awareness	.34***	.22***	.31***
Improvement in quality climate	.13+		
Improvement in commitment to quality at the site			
Adjusted R^2	.49	.53	.38
N	216	216	216

+ = p<.10 ** = p <.05 *** = p < .01

As can be seen, four of the model variables had a significant impact in the hypothesized direction on general orientation to quality. Two and three variables respectively were found to have a significant impact on improvement as part of the job and intrinsic motivation. None of the leader level variables were found to be significant in explaining variations in the three dependent variables. Overall, the individual level antecedents had a stronger effect on all three dependent variables.

The three dependent variables share two antecedents: organizational commitment and quality awareness. The results are broadly consistent with the results of the factor analysis. There is adequate support for separating the two dimensions of commitment to improvement. General orientation to quality and intrinsic motivation share three antecedents while general orientation to quality has an independent antecedent. Table 6.5 presents the results of the *change* data.

Table 6.5: The impact of *changes* in the antecedent variables on *changes* in the three dependent variables - site 1

Antecedent variables	Changes in general orientation to quality	Changes in improvement as part of the job	Changes in Intrinsic motivation
Δ in mgt. commitment to quality			
Δ in sup. commitment to quality	.17**	.14**	.12+
Δ in organizational commitment			.18**
Δ in higher order need strength			.17**
Δ in quality awareness			
Improvement in quality climate		.18+	
Improvement in commitment to quality at the site	.29***		
Adjusted R^2	.06	.06	.05
N	216	216	216

+ = p<.10 ** = p <.05 *** = p < .01

Several points are worth noting from the results shown in Table 6.5. First, the leader level variable relating to *changes* in supervisor commitment to quality had a significant impact on *changes* in general orientation to quality, improvement as part of the job and intrinsic motivation. In addition, the climate variables were found to be significant in predicting *changes* in the two dimensions of commitment to improvement. In terms of the remaining antecedents of *changes* in intrinsic motivation, these were individual level variables.

The results of the *change* data provide stronger support for separating the concepts of commitment to improvement and intrinsic motivation. However, this may be largely a result of how the concepts were measured, specifically, the use of a retrospective time 1 measure for the two dimensions of commitment to improvement.

Are the results found here supported using a different sample and a different organizational context? The next section presents the results of the same analysis using the site 2 data.

6.7.2: Site 2 results

Table 6.6 shows the significant predictors from the intervening and control variables for the three dependent variables at site 2.

Table 6.6: The impact of the antecedent variables on the three dependent variables at time 2 - site 2

Antecedent variables	General orientation to quality	Improvement as part of the job	Intrinsic motivation
Management commitment to quality			-.14+
Supervisor commitment to quality			.11+
Organizational commitment	.26***	.24***	.27***
Higher order need strength	.25***	.13**	.23***
Quality awareness	.29***	.16**	.26***
Improvement in quality climate			
Improvement in commitment to quality at the site	.15**		
Adjusted R^2	.47	.41	.32
N	228	228	228

+ = p<.10 ** = p <.05 *** = p < .01

The results show that four of the model variables had a significant impact in the hypothesized direction on general orientation to quality. The four significant antecedents came from the individual and organizational level categories. This replicates the findings of site 1. There was also consistency across the two sites in the significance of the individual level variables in predicting improvement as part of the job. However, a divergence appears between the two sites in the antecedents of intrinsic motivation. In addition to the significant individual level variables found at site 1, the leader level variables were found to be significant at site 2. In specific terms,

supervisor commitment to quality had a positive impact while management commitment to quality had a negative effect.

In terms of assessing the similarity of the three concepts, there is some support for treating general orientation to quality and improvement as part of the job as separate concepts. There appears to be greater support than found at site 1 for treating intrinsic motivation as distinct from the two dimensions of commitment to improvement. Table 6.7 presents the results of the same analysis using the *change* data.

Table 6.7: The impact of *changes* in the antecedent variables on *changes* in the dependent variables - site 2

Antecedent variables	Changes in general orientation to quality	Changes in improvement as part of the job	Changes in intrinsic motivation
Δ in mgt. commitment to quality			
Δ in sup. commitment to quality	.20***	.17**	
Δ in organizational commitment		.20***	
Δ in higher order need strength	-.11+	-.17***	.19***
Δ in quality awareness			.23***
Improvement in quality climate	.20**	.31***	
Improvement in commitment to quality at the site			.18**
Adjusted R^2	.17	.14	.09
N	228	228	228

+ = p<.10 ** = p <.05 *** = p < .01

The two dimensions of commitment to improvement have significant antecedents from the individual, leader and organizational level categories. In comparison, intrinsic motivation is unaffected by the leader category. In terms of comparison to the results of site 1, the leader and organizational categories are common in predicting *changes* in

the two dimensions of commitment to improvement. The individual level variables are common across the two sites in predicting *changes* in intrinsic motivation. In place of the leader category at site 1, the organizational level category is significant at site 2.

However, the impact of *changes* in higher order need strength on *changes* in the two dimensions of commitment to improvement casts doubt on the appropriateness of measuring change using retrospective questions. The impact is in a negative direction as opposed to the positive impact of higher order need strength on changes (measured independently at time 1 and time 2) in intrinsic motivation. Together these results question the validity of using retrospective data. However, a similar result was not found at site 1. Furthermore, the impact of *changes* in supervisor commitment to quality and organizational commitment have a positive impact on *changes* in improvement as part of the job.

Support was found for treating the two dimensions of commitment to improvement and intrinsic motivation as separate. The subsequent discussion focuses on three main issues. First, the antecedents of the three dependent variables are discussed. This is followed by an examination of the empirical support for treating the three concepts as distinct. Finally, the appropriateness of the model for evaluating the impact of the TQM intervention on the three dependent variables in the subsequent chapter is examined.

6.8 Discussion

In the hypothesized model, the antecedents were categorized in terms of individual, leader and organizational level variables. The results showed that in explaining variations in intrinsic motivation, all three of the individual level variables (organizational commitment, higher order need strength and quality awareness) were

significant across the two sites. Two of these variables: organizational commitment and higher order need strength at site 1 and higher order need strength and quality awareness at site 2 are significant in predicting *changes* in intrinsic motivation. The impact of higher order need strength on intrinsic motivation is not surprising. Individuals who have a natural tendency to want satisfaction and achievement through work are more likely to want to do well in their present job. The impact of organizational commitment on intrinsic motivation is consistent with previous research findings (Mowday et al., 1979; DeCotiis and Summers, 1987). Quality awareness also had a significant impact on *changes* in intrinsic motivation but only at site 2. None of the remaining variables in the model had a strong and/or consistent impact on intrinsic motivation, suggesting that this variable is primarily affected by individual rather than leader or organizational level factors.[1]

Turning to general orientation to quality, there is greater consistency across the two sites in terms of the significant antecedents. In explaining variations in general orientation to quality, the individual and organizational level variables are important. Organizational climate in terms of perceived commitment and support for quality and improvements was found to be important in affecting an individual's general orientation to quality. This is consistent with Lewin's (1951) argument that climate is an important determinant of individual motivation and behaviour. In more recent work, Scott and Bruce (1994) found that a dimension of perceived climate, support for innovation, was positively related to individual innovative behaviour. Thus, climate represents signals an individual receives concerning organizational expectations of

[1] Perceived management commitment to quality has significantly shifted in a negative direction between time 1 and time 2. The negative impact of this on intrinsic motivation may be due to individuals externalizing the consequences of the changes in the sense that management are viewed as less committed to quality while individuals intrinsic motivation has remained unchanged.

behaviour and gives cues as to what is viewed as important by the organization. Consequently, individuals adapt their behaviour to reflect organizational expectations.

While the rationale provided is applicable to general orientation to quality, it raises the question of why a similar effect is not visible for intrinsic motivation. There has been a suggestion that many types of climate exist (Schneider, 1975) but to speak of climate without attaching a referent is meaningless (Schneider and Reichers, 1983). In this study, the climate of interest was support and commitment for quality. Consequently, it may not have very much influence on an individual's desire to work well to achieve intrinsic satisfaction. Also, it may be more difficult for perceptions to affect individual motivation if individuals are already highly motivated. In other words, perceptions of climate may have an impact on shaping particular behaviours or attitudes in the formative stage but once a particular level is reached, the climate loses its impact.

In terms of the impact of leadership on general orientation to quality, the evidence is consistent between the two sites. First, while there is great emphasis placed on management commitment to quality in the literature, this variable was not found to have a significant direct effect on an individual's attitude to quality. This is not to say that it is unimportant as supervisors' behaviour and attitudes may be key indicators of managerial attitudes and behaviour and supervisors look to the level above for cues as to what is important. But, in terms of psychological and physical proximity, the immediate supervisor is closer to the individual and consequently will have a more salient effect.

The importance of supervisory commitment to quality in affecting improvement as part of the job is highlighted by the two sites. This is consistent with the Pygmalion effect (Livingston, 1969; Eden, 1984) in that supervisory behaviour communicates to

subordinates the expectations of the supervisor. Scott and Bruce (1994) found support for this in the context of innovation. Also, the results support Lewin's (1943) concept of psychological proximity in that the immediate supervisor is more proximal to the individual than management and consequently, the supervisor should have a greater influence on individual attitudes and behaviour. These results highlight the importance of the cascading approach of a TQM change intervention. In order to affect employees' attitude to quality and improvement, it is not sufficient for management to be committed to quality as the chain of influence is not a direct one. Consequently, the supervisor has a pivotal role to play in linking management to employees. This is consistent with Klein's (1984) argument on the importance of supervisory support to affect change at the employee level.

To summarise, in broad terms, the significant antecedents of intrinsic motivation are individual level variables. In contrast, the two dimensions of commitment to improvement are influenced not only by individual level variables but also leader and organizational level variables. Thus, the model, in terms of its explanatory power, is better at explaining general orientation to quality and improvement as part of the job than intrinsic motivation.

Overall, there appears to be a subtle difference in the effect of factors external to the individual in affecting the two dimensions of commitment to improvement and intrinsic motivation. Table 6.3 showed that intrinsic motivation elicited a higher score than general orientation to quality and improvement as part of the job (6.16, 5.70 and 4.94 at time 1 respectively). One possible explanation, although purely speculative, is that, once a particular level is reached, external factors lose their impact. For example, intrinsic motivation is very high at both sites (6.22 at site 1 and 6.09 at site 2) so consequently, intrinsic motivation may be impervious to a large degree from the effects

of external forces. In comparison, general orientation to quality and improvement as part of the job may be more easily affected by factors external to the individual as these attitudes may be under the threshold and consequently more susceptible to the influences of external factors.

Turning now to examining the degree of similarity between the three concepts in terms of their significant antecedents, Table 6.8 shows the significant antecedents of the three concepts for the two sites at time 2.

Table 6.8: Significant antecedents of general orientation to quality, improvement as part of the job and intrinsic motivation at site 1 and site 2 at time 2.

Time 2 results	General orientation to quality		Improvement as part of the job		Intrinsic motivation	
Antecedents	**Site 1**	**Site 2**	**Site 1**	**Site 2**	**Site 1**	**Site 2**
Management commitment to quality						✓
Supervisor commitment to quality						✓
Organizational commitment	✓	✓	✓	✓	✓	✓
Higher order need strength	✓	✓		✓	✓	✓
Quality awareness	✓	✓	✓	✓	✓	✓
Improvement in quality climate	✓					
Improvement in commitment to quality		✓				

The most noticeable result is that in broad terms, the three dependent variables share the individual level antecedents: quality awareness, higher order need strength and organizational commitment. General orientation to quality is distinctly affected by organizational level variables. While these results present a more consistent picture of the antecedents of the three dependent variables, they do not go so far as to negate the proposition that these are indeed different concepts. Prior to pursuing this argument, Table 6.9 presents the significant antecedents of *changes* in the three dependent variables.

Table 6.9: Significant antecedents of changes in general orientation to quality, improvement as part of the job and intrinsic motivation at site 1 and site 2

Change over time	General orientation to quality		Improvement as part of the job		Intrinsic motivation	
Antecedents	**Site 1**	**Site 2**	**Site 1**	**Site 2**	**Site 1**	**Site 2**
Management commitment to quality						
Supervisor commitment to quality	✓	✓	✓	✓	✓	
Organizational commitment				✓	✓	
Higher order need strength		✓		✓	✓	✓
Quality awareness						✓
Improvement in quality climate		✓	✓	✓		
Improvement in commitment to quality	✓					✓

Table 6.9 provides greater support for treating the three variables as distinct as there are fewer common antecedents between the three variables. However, the significance attached to these results must be reduced in view of the different methods used to measure change between the two dimensions of commitment to improvement and intrinsic motivation.

Overall, the factor analysis provides stronger evidence for treating the three concepts as distinct as compared to the results of the regressions. Factor analysis is widely used as a method of investigating the independence of constructs being measured. Thus, while two concepts may be independent, it is quite possible that they may be influenced by a substantial number of common predictors.

Putting aside the assessment of independence of concepts using factor analysis, in terms of predictors, what criteria should be used in assessing whether two constructs are independent? At one extreme, if one finds that two concepts have the same antecedents from a given set, what could be inferred from this regarding their independence? On one hand, one could argue that this would question the independence of the two concepts. However, one could also argue that the two concepts may have separate

antecedents that are not included in the particular group of antecedents chosen. In this case, one could argue that the three concepts may be measuring an underlying desire to perform well at work and that they may be measuring distinct aspects or facets of this. Consequently, one may expect the concepts to share a number of antecedents or to be influenced by a number of common factors.

Rather than relying totally on subjective judgment to interpret the degree of independence between the concepts based on their predictors, a crude guideline may help. This involves taking two independent constructs such as intrinsic motivation and higher order need strength (Cook et al., 1981) and then looking at the number of shared antecedents. This will provide a guideline, however crude, for interpreting the results presented in Table 6.8. The rationale for choosing intrinsic motivation and higher order need strength is that these two constructs have been measured here and previously shown to be independent (Cook et al., 1981). Intrinsic motivation and higher order need strength have a correlation of .40 while the average correlation between the three concepts (general orientation to quality, improvement as part of the job and intrinsic motivation) is .44. Consequently, as the correlations are comparable, the number of shared antecedents between intrinsic motivation and higher order need strength provides a reasonable guideline. This would not be the case if the correlation between intrinsic motivation and higher order need strength was radically different from that of the three concepts. Intrinsic motivation and higher order need strength are regressed separately on a set of antecedents[2] in order to determine how many antecedents they share.

[2] The variables included as predictors of intrinsic motivation and higher order need strength were: management commitment to quality, supervisor commitment to quality, quality awareness, organizational commitment, intrinsic job satisfaction, an improvement in quality climate and an improvement in commitment to quality at the site. Also, a series of control variables were included.

The results (Appendix 14) from site 1 showed that intrinsic motivation and higher order need strength shared two antecedents with the latter construct having one separate antecedent. The results from site 2 showed that the two constructs share two antecedents with intrinsic motivation having an additional antecedent. Overall, the results support the contention that while two concepts may be factorially independent, they may be influenced or affected by a substantial number of common antecedents. Using this as a rough guideline, there is support for treating general orientation to quality, improvement as part of the job and intrinsic motivation as independent; that is, the concepts are measuring distinct facets of an individual's desire to work well.

The next issue that needs to be addressed is the consistency of significant antecedents between the two sites. This is based on the assumption that the greater the consistency of predictors in two different organizations and organizational contexts, the more robust the model. Referring to Table 6.8, there is a great degree of consistency in predicting general orientation to quality and improvement as part of the job. In comparison, while there is consistency in the antecedents from the individual level category in predicting intrinsic motivation at the two sites, site 2 has an independent influence from the leader category. Similarly, from Table 6.9, there is greater consistency between the two sites in predicting *changes* in the two dimensions of commitment to improvement than *changes* in intrinsic motivation. Overall, in view of the different organizational contexts, there is a reasonable degree of consistency between the two sites with greater consistency in predicting variations rather than *changes* in the three dependent variables.

The use of intrinsic motivation and commitment to improvement in the literature may reflect different dimensions of employee behaviour in the context of TQM. Intrinsic motivation, general orientation to quality and improvement as part of the job may be

conceptualized roughly in terms of a hierarchical model of employee behaviour. The difference lies in the degree of effort and commitment required from the individual. For example, it seems straightforward in terms of effort, to have employees call attention to problems they have in trying to do their job well. This is similar to Deming's (1986) prescription for management in that they must remove obstacles that prevent individuals from gaining satisfaction from their work (intrinsic motivation). However, regarding improvement as part of the job, one could argue that this requires greater effort from the individual to treat improvements as an integral part of their job.

Finally, the remaining issue relates to how appropriate the model is to examining the impact of the TQM intervention on commitment to improvement in the next chapter. This involves an assessment of how reasonable the model is in predicting the three variables. Table 6.10 combines the significant antecedents of variations in the three variables (Table 6.8) and the significant antecedents of changes in the three variables (Table 6.9)

Table 6.10: Summary of the significant antecedents of variations and changes in general orientation to quality, improvement as part of the job and intrinsic motivation at site 1 and site 2.

	General orientation to quality		Improvement as part of the job		Intrinsic motivation	
Antecedents	**Site 1**	**Site 2**	**Site 1**	**Site 2**	**Site 1**	**Site 2**
Management commitment to quality						X
Supervisor commitment to quality	X	X	X	X	X	X
Organizational commitment	X	X	X	X	X	X
Higher order need strength	X	X		X	X	X
Quality awareness	X	X	X	X	X	X
Improvement in quality climate	X	X	X	X		
Improvement in commitment to quality	X	X				X

Overall, there is empirical support for the model and between the three dependent variables, all the model variables were found to be significant. However, one could question the validity of retaining management commitment to quality as a model variable given its limited effect. The rationale for its inclusion outlined earlier was to investigate the impact of management commitment to quality in relation to supervisor commitment to quality. In order to be consistent between the testing of the antecedent model and using it as a basis for evaluation, management commitment to quality will be retained as a model variable in the subsequent chapter.

6.9 Conclusions

This chapter set out to investigate whether commitment to improvement and intrinsic motivation were the same concepts and thus interchangeable as evidenced in the literature. The results of the factor analysis together with the results of the regressions provide reasonably strong evidence that commitment to improvement is not unidimensional. Furthermore, support was found for treating the two dimensions of commitment to improvement and intrinsic motivation as independent constructs.

In terms of the overall model, there was a reasonable degree of consistency between the two sites in predicting variations in the three dependent variables. In addition, the outlined model contains antecedents that are reasonably good at predicting the three dependent variables. Having assessed the independence of the three concepts and the reasonableness of the model, the next chapter investigates the impact of the TQM intervention on each of the three concepts.

Chapter 7: The Impact of a TQM Intervention on Commitment to Improvement and Intrinsic Motivation

7.1 Introduction

The previous chapter examined the nature of commitment to improvement and intrinsic motivation. The empirical evidence suggested that commitment to improvement was not a unidimensional construct. Rather, it consists of two dimensions: general orientation to quality and improvement as part of the job. In addition, there was empirical support for treating the two dimensions of commitment to improvement and intrinsic motivation as independent constructs. Based on these findings, this chapter sets out to investigate the impact, if any, of the TQM intervention at site 1 on each of the three concepts separately: general orientation to quality, improvement as part of the job and intrinsic motivation.

This chapter may be thought of as an extension of chapter 5 which assessed the impact of the TQM intervention on team orientation. The results indicated that participation in the intervention did not have a significant effect on team orientation. One aspect of the intervention, supervisory reinforcement was found to have a significant total effect on team orientation. To what extent are the findings of chapter 5 replicated with respect to the other key outcomes of TQM; general orientation to quality, improvement as part of the job and intrinsic motivation?

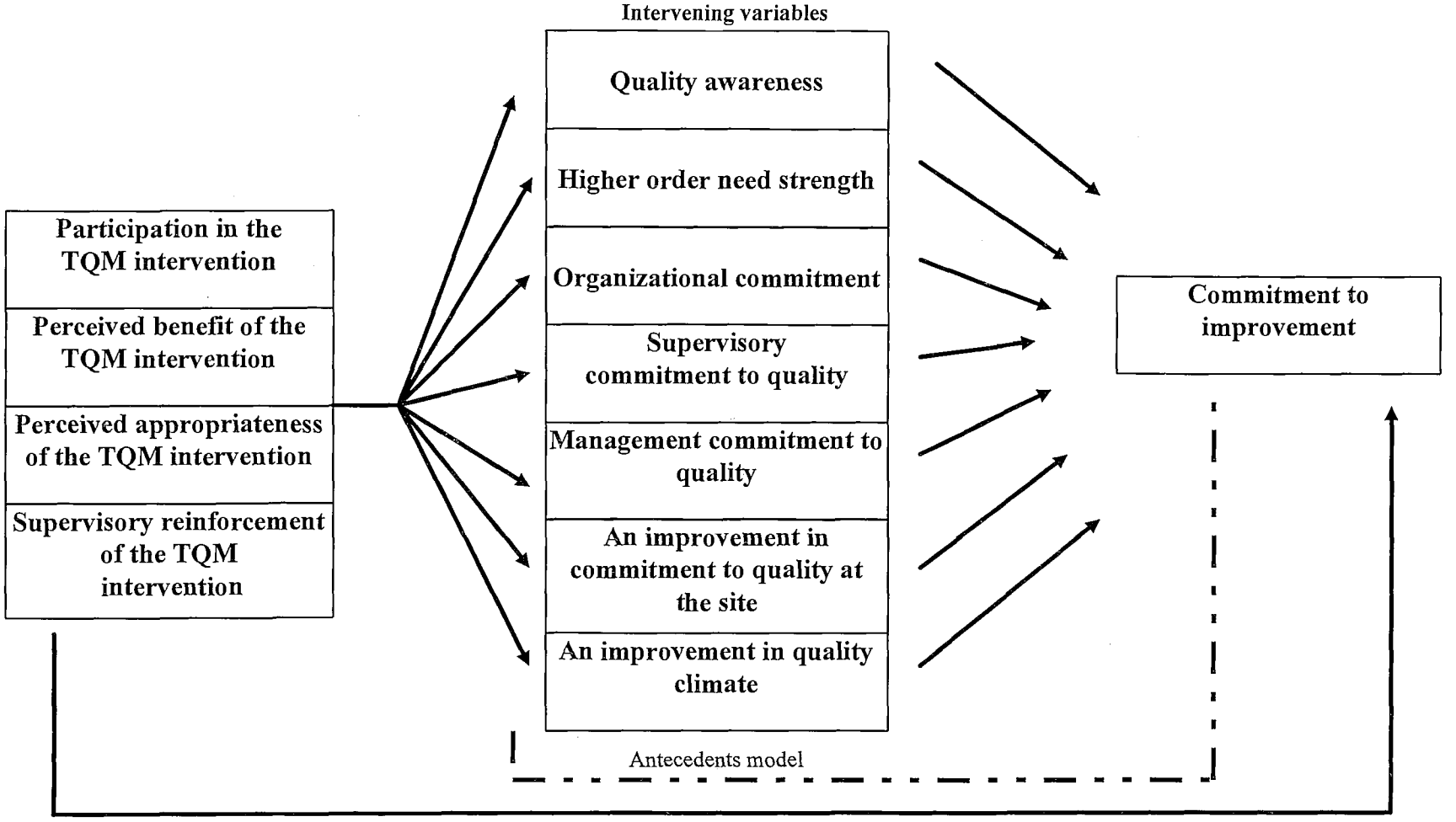
This chapter begins by looking at the evaluation model followed by the descriptive statistics which examine the extent and direction of change in the model variables. Subsequently, the results are presented and discussed.

7.2 Evaluation model

The model of the antecedents of the two dimensions of commitment to improvement and intrinsic motivation outlined in the previous chapter provides a basis for assessing the impact of the TQM intervention on general orientation to quality, improvement as part of the job and intrinsic motivation. A diagram outlining the full evaluation model (containing the intervention variables) is depicted in Figure 7.1. Once again, the intervention is assessed in terms of its total impact on the three dependent variables. This involves assessing the direct and indirect effects of the four intervention variables on each of the dependent variables.

The previous chapter concluded that the 'antecedents' model was reasonably good in predicting the three dependent variables. A rationale was presented for retaining management commitment to quality in the model given its limited effect. However, one could question why, for example, higher order need strength is included as a predictor of improvement as part of the job and similarly, why improvement in quality climate is included in the intrinsic motivation model, as they were not found to be significant predictors when the model was tested in the previous chapter. The rationale for using the same predictors for the three dependent variables is to allow a comparison of the impact of the TQM intervention across the three variables.

FIGURE 7.1: Hypothesized evaluation model of a TQM intervention on commitment to improvement



The evaluation model shown in Figure 7.1 was tested using OLS regression in two stages. The first stage involved regressing the intervening variables (the antecedents) on the control and the intervention variables. In the second stage, the three dependent variables were then regressed separately on all the variables in the model. Similar to the previous chapter, the analysis was conducted on the time 2 cross sectional data and on the *change* data. Prior to presenting the results, the descriptive statistics look at the extent and direction of change in the model variables at site 1.

7.3 Descriptive statistics

Table 7.1 presents the results of the paired sample t-tests for the group of employees at site 1.

Table 7.1: Paired sample t-tests for employees at site 1

Variables	Time 1		Time 2		Change Scores	
Sample (N=165) Employees	Mean	(S.D)	Mean	(S.D)	Mean	(S.D)
General orientation to quality	5.62	(0.83)	5.78	(0.75)	.16	(0.46)***
Improvement as part of the job	4.45	(1.18)	4.58	(1.19)	.13	(0.53)***
Intrinsic motivation	6.20	(0.65)	6.24	(0.68)	.04	(0.60)
Higher Order Need Strength	5.87	(0.81)	5.88	(0.92)	.01	(0.87)
Quality awareness	5.99	(0.66)	5.95	(0.65)	-.04	(0.59)
Organizational commitment	5.32	(0.98)	5.51	(0.99)	.19	(0.72)***
Management commitment to quality	5.10	(1.01)	5.27	(1.03)	.17	(0.86)**
Supervisory commitment to quality	4.91	(1.25)	5.04	(1.19)	.13	(1.12)
Improvement in commitment to quality			4.84	(1.06)		
Improvement in quality climate			4.63	(1.12)		
Participation in the intervention			2.58	(1.15)		
Perceived benefit of intervention			4.20	(1.31)		
Appropriateness of intervention			4.99	(1.26)		
Reinforcement of intervention			4.55	(1.27)		

** T-test difference between Time 1 and Time 2 significant at < than .05 level
*** T-test difference between Time 1 and Time 2 significant at < than .01 level

Overall, with the exception of quality awareness, there has been a general shift in a positive direction. However, this has not been significant in all measures. In terms of the two dimensions of commitment to improvement, there has been a significant positive shift. In contrast, there has not been a parallel change in intrinsic motivation. This may be partly due to the difference in the measurement of the concepts; that is, the independent measurement of intrinsic motivation at time 1 and the retrospective measure to time 1 of the two dimensions of commitment to improvement. In addition, organizational commitment and perceived management commitment to quality have significantly shifted in a positive direction.

7.4 Results

The results of the cross sectional time 2 data are presented first followed by the results of the *change* data. First, the impact of the TQM intervention on the intervening variables is presented. This is followed by the impact of the intervention on the three dependent variables (this is a test of the full model showing the direct, indirect and total effects of the intervention on the three dependent variables). Similar to the previous results chapters, the standardized beta coefficients are shown.

Table 7.2 shows the results of the impact of the intervention and the usual set of control variables (not reported) on the intervening variables.

Table 7.2: Direct effects of the TQM intervention on intervening variables in the model at time 2

TQM Variables	Higher order need strength	Quality aware.	Org. commit.	Sup. commit to quality	Mgt. commit to quality	Improve in quality climate	Improve in commit to quality
1. Participation in TQM Direct Effect on:	.00	-.02	.08	.08	-.04	.12+	.04
2. Perceived benefit Direct Effect on:	-.05	.02	.05	.22***	.21**	.18**	.24***
3. Perceived appropriateness Direct Effect on:	.20+	.15	.34***	-.06	.22**	.18**	.19**
4. Supervisory reinforcement Direct Effect on:	.17+	.10	.07	.47***	.24***	.33***	.21**
Adjusted R^2	.07	.08	.20	.35	.25	.42	.29
N	165	165	165	165	165	165	165

+ = p<.10 ** = p<.05 *** = p<.01

Several points are worth noting from Table 7.2. Overall, participation in the intervention does not have a significant effect on the intervening variables (participation has an effect on improvement in quality climate, significant at 10% level). This parallels the finding of chapter 5 on the lack of significant impact of participation. In contrast, the assessment of the intervention has a significant positive impact on the majority of the intervening variables.

Tables 7.3 presents the total impact of the TQM intervention on the three dependent variables.

Table 7.3: Direct, indirect and total effects of the TQM intervention on the dependent variables at time 2

TQM Variables	General orientation to quality	Improvement as part of the job	Intrinsic motivation
1. Participation in TQM			
Direct Effect on:	.08	-.03	.02
Indirect Effect on:	.03	.04	.03
Total Effect:	.11	.01	.05
2. Perceived benefit			
Direct Effect on:	-.04	.28***	.13
Indirect Effect on:	.07	.06	.01
Total Effect:	.03	.34***	.14+
3. Perceived appropriateness			
Direct Effect on:	.08	-.11	-.11
Indirect Effect on:	.18	.09	.18
Total Effect:	.26***	-.02	.07
4. Supervisory reinforcement			
Direct Effect on:	-.14+	-.09	.02
Indirect Effect on:	.19	.14	.10
Total Effect:	.05	.05	.12
Adjusted R^2	.49	.46	.39
N	165	165	165

+ = p<.10 ** = p<.05 *** = p<.01

Participation in the intervention does not have a significant direct or indirect impact on the three dependent variables. In other words, participants are no more likely to be committed to improvement or intrinsically motivated than non participants. Similarly, supervisory reinforcement of the intervention was not found to have a significant effect on general orientation to quality, improvement as part of the job and intrinsic motivation. However, perceived benefit of the intervention has a significant positive effect on improvement as part of the job and to a lesser extent on intrinsic motivation. Those individuals who perceive the intervention as providing benefit are more likely to be intrinsically motivated and to see improvements as an integral part of their job. Finally, perceived appropriateness has a significant positive effect on general orientation to quality.

Table 7.4 presents the results of the impact of the TQM intervention and the control variables (not reported) on *changes* in the intervening variables.

In terms of the impact of the intervention on changes in the intervening variables,[1] supervisory reinforcement appears to have the greatest effect. Supervisory reinforcement of the intervention was found to have a significant effect on changes in higher order need strength, organizational commitment and perceived supervisor commitment to quality. Neither perceived benefit nor perceived appropriateness were found to have a significant effect on changes in the intervening variables. Participation in the intervention was found to have a mild positive effect on *changes* in organizational commitment (significant at 10% level).

[1] An improvement in quality climate and an improvement in commitment to quality were measured at time 2 only and thus they do not represent changes over time.

Table 7.4: Direct effects of the TQM intervention on intervening variables in the model - change over time (T2-T1)

TQM Variables	Higher order need strength	Quality aware.	Org. commit.	Sup. commit to quality	Mgt. commit to quality	Improve in quality climate	Improve in commit to quality
1. Participation in TQM Direct Effect on:	-.07	.11	.17+	.03	.15	.12+	.04
2. Perceived benefit Direct Effect on:	-.08	-.09	.04	.12	.11	.18**	.24***
3. Perceived appropriateness Direct Effect on:	-.07	-.06	-.14	-.13	-.03	.18**	.19**
4. Supervisory reinforcement Direct Effect on:	.30***	.05	.26***	.18+	.09	.33***	.21**
Adjusted R^2	.03	.00	.06	.07	.05	.42	.29
N	165	165	165	165	165	165	165

+ = p<.10 ** = p<.05 *** = p<.01

Table 7.5 presents the direct, indirect and total effect of the TQM intervention on *changes* in the three dependent variables.

Table 7.5: Direct, indirect and total effects of the TQM intervention on the dependent variables- change over time (T2-T1)

TQM Variables	General orientation to quality	Improvement as part of the job	Intrinsic motivation
1. Participation in TQM			
Direct Effect on:	-.02	-.09	-.04
Indirect Effect on:	.01	.02	.03
Total Effect:	-.01	-.07	-.01
2. Perceived benefit			
Direct Effect on:	-.28***	-.18+	.11
Indirect Effect on:	.12	.11	.03
Total Effect:	-.16**	-.07	.14**
3. Perceived appropriateness			
Direct Effect on:	.05	.08	-.09
Indirect Effect on:	.06	.05	-.04
Total Effect:	.11	.13+	-.13+
4. Supervisory reinforcement			
Direct Effect on:	.12	.01	-.09
Indirect Effect on:	.14	.15	.13
Total Effect:	.26***	.16+	.04
Adjusted R^2	.13	.08	-.01
N	165	165	165

+ = p<.10 ** = p<.05 *** = p<.01

Similar to the cross sectional results, participation in the intervention did not have a significant effect on any of the three dependent variables. Perceived benefit had a significant positive effect on intrinsic motivation and a parallel negative effect on general orientation to quality. Perceived appropriateness had a mild positive effect (significant at 10% level) on improvement as part of the job and a mild negative impact

(significant at 10% level) on intrinsic motivation. Supervisory reinforcement was found to have a significant positive effect on general orientation to quality and to a lesser extent on improvement as part of the job.

7.5 Discussion

The format of the discussion parallels the results; the impact of the intervention variables on the intervening variables is the basis of the initial discussion which is followed by a consideration of the impact of the intervention on the three dependent variables. As noted earlier, greater weight will be attached to the cross sectional results in the discussion.

Intervening variables

Overall, the TQM intervention was found to have a significant impact on the intervening variables. The impact of participation was very limited and this parallels the finding in chapter 5. In contrast, the two assessment variables and supervisory reinforcement of the intervention had a greater impact on the intervening variables. We begin by looking at the impact of the intervention on the individual level variables before moving on to the impact of the intervention on the leader and organizational level variables.

One individual level variable, namely, quality awareness remained unaffected by the intervention.[2] The impact of the intervention on higher order need strength is primarily due to supervisory reinforcement of the intervention. [3] This effect is potentially due to the actions and communications of the supervisor. By involving subordinates in the

[2] The lack of significant effect of the intervention on quality awareness was discussed in chapter 5.

[3] Supervisory reinforcement had a significant effect on changes in higher order need strength (Table 7.4) and also a mild effect on variations in higher order need strength (Table 7.2- significant at 10% level)

intervention, the supervisor may be enhancing their need for achievement and satisfaction through work. In addition, the supervisor may communicate to his/her subordinates the potential of the intervention to give them greater influence and to extend their abilities thus raising the importance individuals attach to the fulfillment of higher order needs.

Individuals who perceive their supervisor as reinforcing the intervention are also more likely to experience greater commitment to the organization. By reinforcing the intervention, supervisors are involving subordinates and allowing them to participate in the improvement process. This is consistent with the links reported in Jermier and Berkes (1979) and Rhodes and Steers (1981) between participatory leadership and organizational commitment. In addition, at time 2, the more individuals perceive the intervention as appropriate, the more committed they are to the organization. However, it is plausible that this relationship operates in the opposite direction; that is, that the more individuals are committed to the organization, the more likely they are to view the intervention as appropriate. As this was found in the results of the cross sectional time 2 data, it is not possible to discern which direction of causation holds true. This is further investigated in chapter 9 which examines the predictors of perceived benefit and perceived appropriateness of the intervention.

The impact of supervisory reinforcement on perceived supervisor commitment to quality is not surprising. This is because reinforcing the intervention is a key behavioural indicator of a supervisor's commitment to quality. The impact of supervisory reinforcement of the intervention on perceived management commitment to quality highlights the importance of the immediate boss. This is in line with Kozlowski and Doherty's (1989) argument. They argue that processes which characterize the interactions within the immediate organizational context are expected to have much

closer links to perceptions. Consequently, leadership behaviours of immediate supervisors are likely to be representative of wider organizational processes. Subordinates who perceive their immediate boss as reinforcing the intervention and therefore being more committed to quality will tend to generalize their perceptions of the supervisor to the organization in general (i.e. management). Further support for this is found in the two organizational climate perceptions where supervisory reinforcement of the intervention was found to be the strongest predictor.

The intervention has a significant impact on individuals' perception of an improvement in quality climate and in commitment to quality at the site. The more positive an individual perceives the intervention to be, the more positive the perceptions of organizational climate. This is not surprising given that organizational climate represents *"perceptually based descriptions of relevant organizational features, events and processes"* (James and Jones, 1974; Jones and James, 1979). Therefore, an individual who perceives their supervisor to be reinforcing the intervention and who perceives the intervention as appropriate and beneficial is more likely to perceive an improvement in quality climate and commitment to quality at the site. Once again, it is not an individual's participation in the intervention per se that affects their climate perceptions but rather the assessment of the intervention

To summarize, the intervention was found to have a significant effect on the intervening variables. However, the impact varied from having no significant impact on an individual's quality awareness to having an extensive impact on an individual's perception of an improvement in quality climate. We now turn to the overall impact of the intervention on the three dependent variables.

Intrinsic motivation

Overall, the intervention has a significant impact on intrinsic motivation. Specifically, one aspect of the intervention; perceived benefit has a significant positive effect on *changes* in intrinsic motivation and a mild positive effect on variations in intrinsic motivation. Wilkinson et al. (1990, 1991) provide case study evidence which suggests that TQM may offer tangible benefits to employees. The findings of this study go further to suggest that if individuals perceive the intervention as providing some benefit to them, they are more likely to experience greater intrinsic motivation.

The explanation provided by some of the quality proponents would be that perceived benefit would involve eliminating some of the obstacles that prevent employees from doing the best job they can. This explanation would involve viewing a TQM intervention as providing a legitimate mechanism that allows and encourages employees to voice problems or constraints they have that makes it more difficult for them to do an efficient or quality job. These inhibitors may include material resources, physical work-environment variables or work processes. Consequently, by eliminating obstacles individuals confront in doing their job, the individual is given more control over his/her performance thereby strengthening the link between effort and performance which should, in turn, result in greater intrinsic motivation. Fisher (1978) found support for the link between personal control over performance and intrinsic motivation.

The measure of perceived benefit is a crude one and consequently, it is not possible to outline specifically what individuals see as beneficial in terms of what the TQM intervention provides. Benefit to some individuals may be interpreted as making their job easier (the elimination of obstacles), while for others, it may be perceived as giving them an opportunity for greater involvement and greater influence in their work area.

Wilkinson and Willmott (1995) note that benefits to employees may include the removal of excessively close supervision, unreliable services from other departments and the lowering of barriers between management and employees. Regardless of how benefit is perceived, there is an element of self interest that seems to influence an individual's intrinsic motivation.

Improvement as part of the job

Perceived benefit of the intervention also has a significant effect on improvement as part of the job (it should be noted that the direct effect of perceived benefit on improvement as part of the job is significant). Thus, the greater the perceived benefit of the intervention, the more an individual perceives improvements as an integral part of their job. The explanation may be similar to that of intrinsic motivation. Employees may view the intervention as providing the opportunity for them to make improvements in their work and how they accomplish it and consequently be more inclined to view improvements as an integral part of their job.

Although purely speculative, the direction of influence between perceived benefit and improvement as part of the job may go the other way; that is, that individuals who view improvements as part of their job are more likely to assess the intervention as beneficial. Individuals may see the intervention as providing a concrete mechanism by which improvements may be implemented.

General orientation to quality

Perceived benefit of the intervention was not found to have a significant effect on general orientation to quality. Rather, another aspect of the intervention, its perceived appropriateness, was found to have a significant effect. In other words, the more appropriate individuals perceive the intervention to be, the more oriented they are to quality. In chapter 3, a rationale was put forward for including the direct and indirect effects of the intervention thereby evaluating the intervention on the basis of its total impact. A case in point is the impact of perceived appropriateness on general orientation to quality. If one were to rely on direct effects, from Table 7.3, one can see that perceived appropriateness does not have a significant direct effect on general orientation to quality. However, by including indirect effects, perceived appropriateness has a significant total effect.

The differing impact of perceived benefit and appropriateness on the three dependent variables is an interesting finding. Perceived benefit has a significant impact on intrinsic motivation and improvement as part of the job; perceived appropriateness has a significant effect on general orientation to quality. What this appears to indicate is that for the intervention to affect an individual's attitude toward their present job, it must satisfy an individual's self interest by providing some benefit to them. As mentioned before, the measure of benefit is a crude one and it is quite possible that an individual may not perceive the same benefit as having an impact on both intrinsic motivation and improvement as part of the job. The differentiating characteristic of general orientation to quality is that it does not focus on an individual's job or their attitude toward their job. It is more altruistically oriented in the sense that it taps a general willingness to prevent mistakes in the work area and satisfaction from making a contribution to improving things generally.

Perceived appropriateness includes one item that taps benefit to the individual. But overall, the emphasis is on appropriateness of the intervention as a way of bringing about the needed change at the site, the perceived priority placed on the intervention as well as the perception of equal benefits to management and employees. This result raises the question of why perceived appropriateness positively affects general orientation to quality but not intrinsic motivation and improvement as part of the job (significantly affected by perceived benefit of the intervention). One potential explanation is that individuals have a general orientation to quality (this is an assumption made by most of the quality proponents) and the intervention provides and appropriate mechanism to allow this orientation to develop. One could speculate that the direction of influence may go the other way. Individuals who have a general orientation to quality may be more likely to see the intervention as an appropriate way to bring about the change needed at the site. Due to the nature of the data, it is not possible to ascertain, in this case (as with improvement as part of the job) the direction of influence.

These findings are subject to a number of caveats. First, the evaluation model assumes that the direction of influence is from the intervention to the three dependent variables. In other words, the model assumes that general orientation to quality, improvement as part of the job and intrinsic motivation are endogenous in relation to the other variables in the model. This was not challenged here.[4] It is plausible that individuals who are oriented toward quality to begin with will be more likely to view the intervention as appropriate. Similarly, individuals who are intrinsically motivated and who view improvements as an integral part of their job may be predisposed to perceiving the

[4] In Chapter 4, the endogeneity assumption was tested using cross lagged regressions. In this chapter, it was not possible to do this in light of the method by which change in general orientation to quality and improvement as part of the job was measured.

intervention as providing benefit. Second, although the impact of perceived benefit is consistent with previous research findings and suggestions, the measure used here is general and crude. Future studies should consider in specific terms what individuals see as beneficial. Despite the limitations of these findings, there are practical implications for the implementation of TQM

Overall, the findings suggest that the intervention has differential effects depending on the attitude and behaviour being affected. Therefore, if one intends to affect "injob" attitudes and behaviours (this includes intrinsic motivation and improvement as part of the job which focus on individual attitudes toward the job), then the results suggest that for this to occur, an individual must perceive the intervention as providing benefit to them. However, perceived benefit, may not be important for affecting an individual's attitude to quality and improvement in the wider work area. In this case, it is more important for individuals to see the intervention as appropriate. Consequently, different aspects of the assessment have different effects on a range of individual quality oriented attitudes and behaviours with the key distinguishing characteristic being whether these attitudes and behaviour are inward (toward the job) or outward (toward the work group or work area).

Finally, the lack of significant effect of participation is consistent with the findings of chapter 5. Thus, participation was not found to have an important influence on team orientation, general orientation to quality, improvement as part of the job or intrinsic motivation. This suggests that it is not what individuals do that is important but rather what they think. As participation and assessment were measured at the same time, it is not possible to discern the direction of causation between them. It is quite possible that participation influences assessment which in turn influences future participation. For example, an individual who participates in the intervention and makes a positive

assessment may desire greater participation. On the other hand, an individual may make an initial assessment which influences their future participation. With this in mind, the thesis so far suggests that when participation and assessment are considered as competing predictors, assessment is more significant in affecting subsequent attitudes and behaviour.

In terms of the impact of assessment of the intervention, from this chapter it was shown that perceived benefit and appropriateness affected the dependent variables differently. In chapter 5, the significant predictor was supervisory reinforcement[5] of the intervention. If these results are broadly correct, there are implications for the management of a TQM change intervention. As well as attempting to ensure that the intervention is perceived as beneficial, it may also be necessary to "manage" how the intervention is perceived along other dimensions of assessment. However, this recommendation must be viewed in light of the limitations of this study. First, what may hold true in the short term may not apply to the longer term. Second, it would be necessary in future studies to tap a wider range of assessment dimensions. Nonetheless, different dimensions of assessment seem to have a differential impact on quality attitudes and behaviour.

7.6 Conclusions

This chapter set out to investigate the impact of a TQM intervention on general orientation to quality, improvement as part of the job and intrinsic motivation. Overall, the intervention had a significant total effect on all the variables examined here. Perceived benefit of the intervention had a significant effect on improvement as part of the job and intrinsic motivation; perceived appropriateness had a significant effect on

[5] This is not an assessment variable in terms of how individuals perceive the intervention per se. Rather, it taps an assessment of the process of implementation.

general orientation to quality. Overall, the findings suggest that the intervention has a differential effect depending on the type of attitude and behaviour being affected.

Participation was not found to have a significant effect on any of the dependent variables. This result is consistent with the findings of chapter 5. The next two chapters pick up a different line of investigation by looking at the antecedents of employee participation in and assessment of the intervention.

Chapter 8: Predictors of Employee Participation in a TQM Intervention

8.1 Introduction

Up to this point, the focus has been on assessing the impact of the intervention on some of the core elements of TQM. Chapter 5 examined the impact of the intervention on team orientation and showed that the intervention did not have a significant direct effect on team orientation. However, the intervention was found to have a significant total effect on team orientation. Chapter 7 showed that the intervention had a significant total effect on general orientation to quality, improvement as part of the job and intrinsic motivation. In the case of improvement as part of the job, the intervention did have a significant direct effect. Overall, the intervention was found to have a significant total effect on all the core variables in this study.

A key finding of this evaluation is that participation *per se* did not have a significant impact on any of the core outcome variables examined here (i.e. team orientation, general orientation to quality, improvement as part of the job and intrinsic motivation). Rather, it was individuals' assessment of the intervention that played a significant role in affecting the core elements of TQM. In particular, supervisory reinforcement of the intervention had a significant (albeit indirect) effect on team orientation while perceived benefit and appropriateness of the intervention were found to have a differential impact on the two dimensions of commitment to improvement and intrinsic motivation.

An assumption of the previous chapters was that the TQM intervention (participation in and assessment of) was exogenous in relation to the remaining variables. In other

words, participation in and assessment of the intervention were treated as antecedents rather than consequences of the other variables. This and the following chapter test the validity of this assumption as one could plausibly argue that attitudes prior to the intervention may affect an individual's participation in and assessment of the intervention itself.

Consequently, this and the following chapter signal a change in the line of inquiry from evaluating the impact of the intervention to examining the predictive power of antecedent attitudes on individual participation in and assessment of the intervention. More generally, the overall question we now turn to is what predicts individuals' participation in the intervention and their assessment of it. We start by examining the predictors of participation. As we have seen, participation does not have a clear effect on subsequent attitudes. Nevertheless, an analysis of the factors which affect participation is important for two reasons. First, comparing the predictors of participation in and assessment of the intervention, may provide an important insight as to why assessment is more powerful than participation in predicting subsequent attitudes. Second, participation has and continues to attract a great deal of academic attention. Questions such as do workers want participation? To what extent do workers want participation? What types of outcomes are associated with different participation strategies? and Who participates? are some of the key areas that have been addressed by researchers (for example, Hespe and Wall, 1976; Ramsay, 1976; Marchington, 1980; Wall and Lischeron, 1977). This chapter focuses the last question in the context of a TQM intervention.

Employee participation is a widely researched area. Generally, the primary focus of empirical research and a point of considerable debate concerns the outcomes resulting

from various participation strategies.[1] Far less attention has been given to the antecedents of participation. In briefly reviewing relevant literatures in this area, emphasis is placed on research investigating the factors influencing participation in Quality Circles (QCs) as it is highly related to the form of employee participation in TQM. In fact, it has been argued that QCs are an inherent component if TQM (Ishikawa, 1985). However, QCs and TQM differ with respect to the role of supervisors and the degree of choice which employees may have in participating. These may have consequences for who participates in TQM and are discussed later.

Rafaeli (1985) suggests that different employees may react more positively to QC activities than others. The author offers the following factors that may affect an individual's reaction to QC activities; preferred leadership style, growth need strength and job involvement. Bruning and Liverpool (1993) suggest that due to the voluntary nature of QCs, QC members would have a greater desire to participate than nonmembers. In addition, the authors suggest that there is a possibility that participants may have different personal characteristics to non participants. They found that QC participants reported higher levels of desired and perceived actual participation, they were more highly educated and exhibited lower needs for dominance than non members. The authors argue that QCs attract different types of individuals. However, their research methodology was cross sectional in nature and the QCs were in operation from 3-5 years. Hill (1991b) argues that cross sectional research has shortcomings for QC research or any employee participation program that is voluntary based.

[1] See Coch and French, 1948; Guzzo et al., 1985; Lawler, 1982 and; Miller and Monge, 1986 for evidence in support for participation. Contrary evidence is presented by Locke et al., 1980; Wagner and Gooding, 1987a, 1987b and; Wagner, 1994.

In attempting to investigate differences between participants and non participants using a cross sectional research design, any significant differences may be due not to membership of QCs but rather due to prior differences that led volunteers to select themselves for membership. There is evidence that where employee participation programs are voluntary, based on pre program preferences, self selection of individual into these programs is not uncommon (Cutcher-Gershenfeld, 1986; Verma and McKersie, 1987). Graham and Verma (1991) argue that where a self selection process is at work, it is important to identify the influence of self selection characteristics on participation-outcome relationship. Griffin (1988) echos a similar message and calls for additional research to gain insight into who chooses to participate in QCs.

There has been some research within the general arena of participation on the link between individual characteristics and attitudes toward participation such as age (Sheppard and Herrick, 1972), bureaucratic orientation (Gordon, 1970), gender and length of service (Hespe and Wall, 1976 for a review). However, there is a need to investigate a wider range of characteristics that predispose some individuals to participate and others not to participate. In participation programs where individuals exercise choice as to whether to participate or not, characteristics which distinguish participants from non participants may have an impact on the participation-outcome relationship.

As Hill (1991b) states " *outside the framework of TQM, circles continually run up against the problem that organizations are not structured to respond to bottom-up initiatives.....*" (p556). TQM overcomes the problems of QCs by integrating quality improvement into the existing organizational hierarchy. It does this by adopting a top down approach to change thus overcoming the problems faced by middle managers to bottom up initiatives. Middle managers are fully integrated into the quality

improvement process thus potentially overcoming the problem faced by QCs, that of resistance from middle managers (Hill, 1991b; Collard and Dale, 1989). Hill (1991b) presents evidence that middle managers gained from TQM through greater influence and involvement from their superiors. TQM involves a cascading process of increased involvement of various layers of management culminating in the first line manager/supervisor involving his/her subordinates in the improvement process. Thus, the involvement of one level in the organization is dependent upon the actions of the next level. In practice, Hill (1991b) found that a number of managers failed to develop participative teamworking among subordinates and to pursue improvement efforts.

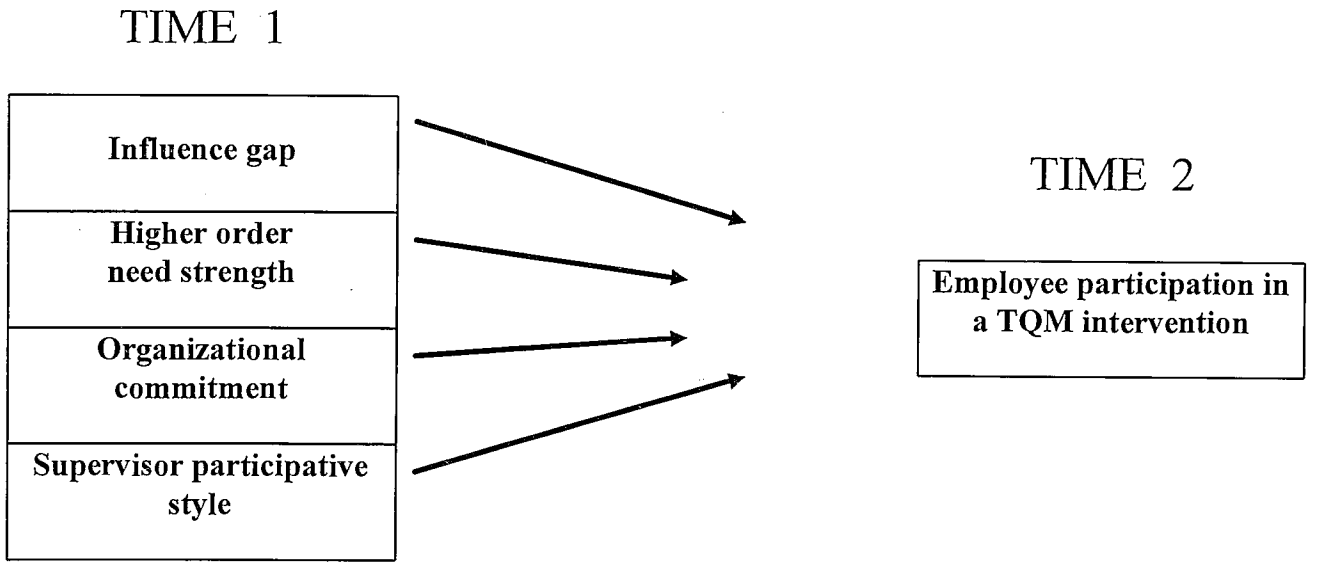
The emphasis on the cascading approach to involvement in TQM departs from the more independent free standing mechanism of QCs. This may have implications for the factors affecting participation in TQM. More specifically, the antecedents of employee participation may not lie exclusively at the level of individual attitudes and characteristics (as seems to be the case with QCs) but may also include the behaviour of individuals in level(s) above.

With this in mind, this chapter explores the predictors of employee participation in a TQM intervention. Using the empirical work on QCs and the framework of TQM, an hypothesized model of the predictors of employee participation is outlined and tested. In the subsequent chapter, this is extended to an investigation into the predictors of employee assessment of the TQM intervention. This is important in view of the significant impact of the assessment of the intervention shown in previous chapters. The following section outlines an exploratory model of the predictors of employee participation in TQM. This is followed by a discussion of the analysis procedures adopted. Finally, the results are presented and discussed.

8.2 An hypothesized model of employee participation in a TQM intervention

Figure 8.1 presents a diagram of the hypothesized model of employee participation in a TQM intervention. Four main variables are hypothesized to affect an individual's participation in the intervention; supervisor participative style, organizational commitment, higher order need strength and influence gap. A second model is tested which includes perceived benefit of the intervention in addition to the outlined predictors. The rationale for testing this second model is presented in the next section

FIGURE 8.1: Hypothesized model of employee participation in a TQM intervention



Individual and participation This category includes an individual's attitude toward the organization, toward work in general and perception of his/her desired and actual influence in their work area. Organizational commitment is hypothesized to positively affect an individual's participation in TQM. There are two strands of thinking in relation to organizational commitment. The first strand views organizational commitment as an outcome of some form of participation (Griffin, 1988; Wall et al., 1986; Bruning and Liverpool, 1993). Mathieu and Zajac (1990) argue that organizational commitment is a useful criterion for a range of organizational interventions (to include participation) aimed at improving employee attitudes and behaviour.

The second strand interprets organizational commitment as an antecedent of a range of behavioural outcomes; extra role behaviour (Katz and Kahn, 1978; Brief and Motowidlo, 1986), increased effort (Randall, 1990) and Organizational Citizenship Behaviour (Eisenberger et al., 1990). This view hypothesizes that individuals who are committed to the organization are more likely, in a variety of ways, to exert effort on behalf of the organization. Following from this, given the opportunity to participate in work related matters, individuals with greater commitment to the organization are more likely to take the opportunity to participate.

The first perspective assumes that behaviour (e.g participating in an organizational intervention) will lead to greater affective attachment to the organization. The second strand posits that greater affective attachment to the organization will result in behavioural outcomes. Consequently, organizational commitment may be viewed as an outcome or an antecedent.

A number of studies investigating the impact of QCs on work outcomes have used organizational commitment as an outcome (Bruning and Liverpool, 1993; Rafaeli, 1985; Griffin, 1988). With the exception of the last study, the remaining studies were cross sectional in nature. Griffin (1988) in his study found no significant differences between volunteers and non volunteers for the QC program prior to its introduction. This would suggest that organizational commitment is not a differentiating factor between those who volunteered for QC participation and those who did not. However, Randall's (1990) meta analysis of organizational commitment-work outcome relationships highlighted a weak positive relationship between organizational commitment and effort. In addition, DeCotiis and Summers (1987) found that organizational commitment had a direct positive effect on employee motivation. Brief and Motowidlo (1986) argue that components of organizational commitment indicate dispositions toward prosocial behaviour directed toward the organization. This would be consistent with previous research (Katz and Kahn, 1978) that committed individuals are more likely to engage in extra role behaviours. Together these findings would support the proposition that individuals who are committed to the organization are more likely to exert effort on behalf of the organization. Following from this, it is hypothesized that highly committed employees would be more likely to participate in organizational interventions should the opportunity arise.

Higher order need strength is also hypothesized to have a positive impact on an individual's participation in TQM. In other words, given the opportunity, individuals with a greater need for achievement and satisfaction through work, are assumed to be more likely to participate in TQM. Marks et al. (1986) found significant differences in growth need strength between participants and non participants. The inclusion of higher order need strength rests on a similar rationale to that provided by Hackman and Oldham (1980) for job redesign. They hypothesize that individuals with strong needs

for growth are more likely to respond more positively to jobs high in motivating potential than individuals with weak growth needs.

Higher order need strength has primarily been used as a moderator between work redesign and the hypothesized outcome of intrinsic motivation. There is some debate on the moderating effect of higher order need strength. Spector (1985) argues that six published reviews of the area have failed to agree that a moderator effect exists. The results of his meta analysis supports the Hackman and Oldham (1980) model with high need strength individuals responding more predictably. Taking Rafaeli's (1985) suggestion that higher order need strength may be one factor that differentiates individuals reactions to QC activities, it is included in this model as a potential predictor of employee participation in the intervention.

In view of the fact that QCs are designed to give employees greater participation in their work and/or greater influence in decision making, it is hypothesized here that the greater the difference between desired and perceived actual, the greater the likelihood that an individual will participate in the intervention. Hill (1991b) found evidence that QC members had a greater desire for participation in managerial decision making than non participants. In contrast, Rafaeli (1985) found no difference in desired influence between members and non members but found a significant difference in perceived influence in favour of members.

Graham and Verma (1991) in the study of employee responses to employee participation programs used a measure of the perceived gap between the desired and actual influence. In their study, they found that the influence gap moderated the positive relationship between affect toward Employee Participation Programs (EPPs) and the length of involvement in the program. In other words, individuals who were

most dissatisfied with existing opportunities to participate in decision making had a more positive view of the outcomes of EPPs than those individuals who were reasonably satisfied with their opportunity to participate. Individuals who perceive a gap between their desired level of influence and their actual influence will be more likely to participate in the intervention in order to reduce this gap. In other words, individuals who have less influence over decision making than they would like will be more likely to participate in the intervention in the hope of increasing the influence they have thereby reducing the gap between the influence they want and what they have. This assumes, in the first instance, that individuals perceive the intervention as providing the opportunity for greater influence over decision making.

Leader and participation Supervisor participative style is hypothesized to positively affect subordinate participation. In terms of the classification adopted by Cotton et al. (1988), supervisory participative behaviour would fall into the category of informal participation. It is classified as such as it occurs through the interaction between supervisors and subordinates. Steel and Lloyd (1988) note that supervisors who encourage employee participation may feel more comfortable with QCs and be more likely to choose the installation of QCs in their work area. In the context of TQM, supervisory interaction with subordinates provides an opportunity for subordinates to participate in the improvement process. Given the top down cascading approach of TQM to affecting change, the involvement of employees is dependent upon their immediate supervisor providing the opportunity for their participation. Klein (1984) argues that the support of first line supervisors is a crucial factor if meaningful changes are to take place in the workplace. Hence, in this model, it is hypothesized that supervisory participative style will have a positive impact on employee participation in the intervention.

8.3 Additional model and analysis procedures

This section presents a rationale for testing a variation of the model outlined in the previous section. This is followed by a discussion of the analysis procedures adopted. The second model includes a measure of perceived benefit of the intervention. The rationale for including it in the model is that individuals who perceive the intervention as providing some benefit to them will be more likely to participate in the intervention. This is based on a strict assumption that individuals make a cognitive judgment prior to participating in the intervention. However, it is quite possible that perception of the benefit occurs as a result of participation. Also, it is plausible that perceptions of the benefit may change over time. An individual may, for example, perceive the intervention as providing benefit prior to the intervention but as a result of participation may change his/her view of the benefit. This may occur as a result of high expectations being set of the benefits the intervention will bring which an individual feels are not met as a result of the experience of participation. The analysis is conducted exclusively on employees at site 1 which implemented a TQM intervention between time 1 and time 2.

All the independent variables included in the basic model were measured at time 1 prior to the intervention. At this point, none of the respondents had any knowledge that the intervention was going to take place thereby providing a rigorous test of whether attitudes at time 1 can predict participation in the intervention at time 2.

The two models were tested separately using Ordinary Least Squares (OLS) regression. The single new measure used in the analysis and not previously discussed is that of an influence gap. This was measured by asking individuals how much influence they would like to have over day to day work decisions that affect them. They were also

asked how much influence they had over day to day work decisions that affected them. Their perceived actual influence was subtracted from their desired influence to give an influence gap.

8.4 Descriptive statistics

Table 8.1 presents the results of t-tests between participants and non participants in the intervention. As discussed in chapter 5, employees varied in the degree to which they were participating in the activities of the intervention. To capture this variation, individuals were asked the extent to which they were participating in the intervention. Responses were elicited on a five point Likert scale (not at all to a very great extent). Individuals who responded in the categories of *"not at all"* and *"not much"* were treated as non participants. Individuals who responded in the categories of "*to some extent*", "*to a great extent*" and "*to a very great extent*" were treated as participants.

Table 8.1: Independent t-tests between participants and non participants in the intervention.

	Participants (n=86)		Non-participants (n=78)	
Time 1	Mean	(S.D.)	Mean	(S.D.)
Organizational commitment	5.40	(0.90)	5.25	(1.06)
Higher order need strength	6.00	(0.73)	5.74	(0.87)**
Influence gap	0.80	(1.01)	0.88	(1.03)
Supervisor participative style	5.35	(1.02)	4.58	(1.07)***

** = $p < .05$ *** = $p < .01$

As shown in Table 8.1, significant differences were found at time 1 (prior to the intervention) between participants and non participants. These differences were found

in higher order need strength and perceived supervisor participative style with participants being more positive. However, there were no significant differences between the two groups in their commitment to the organization and the perceived gap between desired and actual influence.

While the t-tests suggest that participants may have been more positive than non participants on some dimensions at time 1, this is tested more fully and rigorously below using regression analysis controlling for a series of demographic factors.

8.5 Results

Table 8.2 presents the results of the predictors of employee participation in TQM using the predictors measured at time 1 and also including perceived benefit of the intervention measured at time 2.

Table 8.2: Predictors of employee participation in a TQM intervention

Predictors (Time 1)	Time 2	
	Participation in TQM	Participation in TQM
Job Tenure	.07	.12
Age	.09	.08
Gender	-.09	-.09
Length of service	-.16+	-.14+
Job Title 2	.11	.08
Job Title 3	.22***	.17**
Supervisor participative style	.30***	.23***
Organizational commitment	.00	-.06
Higher order need strength	.12	.08
Influence gap	.13+	.11
Perceived benefit of TQM intervention†		.37***
Adjusted R^2	.13	.25
N	164	164

+ = p<.1 ** = p<.05 *** = p<.01

† Measured at time 2

The results[2] show that in the basic model, containing predictors measured at time 1 only, only one of the four hypothesized variables had a strong significant impact on employee participation in the TQM intervention. This was supervisor participative style. To a lesser extent (at 10% level), the gap between desired and perceived influence was also found to have a positive impact on participation in the intervention. When perceived benefit of the intervention is included in the model as a predictor of employee participation, it was found to have a significant effect. The inclusion of perceived benefit increases the explanatory power of the model from 13% to 25%.

[2] The results of the analysis using logistic regression are presented in Appendix 15. Overall, the results yield similar results to those found using OLS regression.

8.6 Discussion

Supervisory participative style

The important finding is that supervisory participative style at time 1 is a significant predictor of employee participation in the intervention at time 2. In other words, the results indicate that supervisors who are participatively oriented prior to the intervention are more likely to involve their subordinates in the TQM intervention. This finding is consistent with the underlying approach to change underlying TQM; that is, supervisors are the key mechanism for providing the opportunity for employees to participate in TQM. It also suggests though, that the participative objective of the intervention is more likely to be implemented by supervisors/managers who normally manage along participative lines.

In this context, it is worth noting that employees who have participated in the intervention do not perceive their immediate boss as becoming more participative as a result of the intervention. Participants report a mean score of 5.35 at time 1 and 5.47 at time 2 for supervisor participative style. This lack of significant positive change may indicate that for this group of supervisors, the participative objective of the intervention, in terms of, involving subordinates in the intervention, has been achieved. What does not appear to have been achieved though is a move toward a more participative style amongst this group of supervisors.

In contrast, for non participants, perceived participative style of their immediate boss has increased from 4.58 at time 1 to 4.82 at time 2 (significant at 10% level). This may indicate a move toward a more participative style of managing which needs to continue so that subordinates are given the opportunity to participate in TQM. Time 2 represents a point in the change process so in order to investigate whether, in the case of non

participants, greater supervisory participation leads to subordinate participation, it would be necessary to monitor the process of change as it develops.

At least in the short term, the results indicate that supervisors who are generally more participatively oriented will involve subordinates in TQM. This does not seem to be due to an attitudinal or a behavioural change but simply because it is the normal style of the supervisor. This issue is pursued in greater detail in a later chapter. For those supervisors who are less participative in their style, in the short term, there does not appear to have been a sufficient change in their participative orientation to allow employee involvement in TQM. This is broadly consistent with Hill's (1991b) finding where a number of managers failed to develop a participative oriented style of managing to involve subordinates in the improvement process.

Organizational commitment

Organizational commitment is not a significant predictor of employee participation in TQM. Participants and non participants were not significantly different at time 1 in terms of their commitment to the organization. Consequently, the degree of commitment to the organization does not differentiate participants from non participants. In other words, individuals who are more committed to the organization are **not** more likely to participate in the intervention than those who are less committed. This is contrary to the hypothesis and is pursued later in the discussion. A methodological point is worth discussing here regarding the use of cross sectional data. If, for example, this analysis is restricted to the time 2 data; that is, replacing the predictors measured at time 1 with the same predictors measured at time 2, the results would indicate that organizational commitment has a significant positive effect on participation in the intervention. From this, one would have argued that individuals who are more committed to the organization would be more likely to participate in the

intervention than individuals who are less committed. However, the more rigorous time 1 predictors as used here show that organizational commitment does not significantly affect employee participation in the intervention.

Higher order need strength and influence gap

Higher order need strength and influence gap were not found to be significant in predicting employee participation. Thus, individuals who have a greater need for satisfaction and achievement through work are no more likely to participate in TQM. Similarly, individuals who desire greater influence than they perceive they have are no more likely to participate in TQM than individuals who have the influence they desire. While participants and non participants are significantly different in terms of higher order need strength at time 1, once other factors are controlled for, higher order need strength does not have a significant effect on subsequent employee participation in the intervention. This significant difference between participants and non participants at time 1 goes against previous research (Marks et al., 1986). However, the results here are in line with other research findings (Griffin, 1988). In terms of methodological rigour, the results suggest that controlling for other factors, higher order need strength or influence gap do not have a clear predictive effect on employee participation in the intervention. This lack of significant effect may be due to the nature of employee participation in TQM. This is discussed later as the explanation may be equally applicable to the lack of significant effect of organizational commitment.

Perceived benefit of the intervention

Perceived benefit of the intervention, when added as a predictor of employee participation in TQM, was found, (in addition to supervisor participative style) to have a significant positive effect. In other words, individuals who perceive the intervention as providing benefit to them in terms of their job are more likely to participate in TQM.

This assumes that individuals assess the intervention prior to participating in the intervention and that perceived benefit is a predictor of participation. This may or may not be the case. An individual may participate in the intervention and based on that experience make an assessment of the intervention. That is to say, participation may be a predictor of perceived benefit rather than the other way around. Furthermore, it is plausible that individuals make an initial assessment based on the knowledge they have at the time which may change in a positive or negative direction when they have acquired further information or participated in the intervention. As employees' participation in the intervention and their assessment of it was collected at the same point in time, it is difficult to discern the sequence of events in relation to participation and assessment. The subsequent chapter picks this up when it looks at the antecedents of assessment of the intervention.

In summary, the findings indicate that the only clear and significant predictor of employee participation in the intervention is the participative orientation of their immediate supervisor. Consequently, in the short term, employee participation will take root where employees are accustomed to a more participative style of managing. The results highlight the distinctive nature of employee participation in TQM compared to other types of employee participation programs (EPPs). The primary difference relates to the participative mechanism. In EPPs, a mechanism is put in place independent of employees' supervisor and employees are asked to volunteer for participation in the program. Consequently, employee participation is largely independent (or not dependent upon) of the actions of the supervisor. Given the cascading approach to change inherent in TQM, employee participation is dependent upon the supervisor allowing and facilitating their involvement. In other words, regardless of how committed an individual is to the organization or how much more influence they desire, they cannot participate in the intervention unless they are given

the opportunity to do so and this opportunity occurs via the behaviour of the immediate boss. Therefore, while TQM has the potential to overcome the problems of QCs (Hill, 1991b), it is faced with a potentially different obstacle; that is, having to change the style of managing of supervisors to allow employee participation.

Graham and Verma (1991) conclude that in order to ensure that employees view the outcomes of EPPs favourably, it is necessary to manage individual "proximity" to EPPs. In other words, it is important to plan rapid diffusion of the EPP so as to increase individual proximity to the program. Chapter 5 highlighted that non participants in the intervention experienced a reduction in their team orientation. The explanation offered was that this may be due to unmet expectations as a result of their lack of involvement. Consequently, attention was directed to a more rapid diffusion of the opportunity for employees to participate in the intervention. The results of this chapter highlight that supervisory behaviour may present a stumbling block for the rapid diffusion of employee participation in a TQM intervention.

8.7 Conclusions

To conclude, restricting the analysis to using attitudes and perceptions of behaviour measured at time 1, the only significant predictor of employee participation in TQM is supervisory participative behaviour. This is consistent with TQM and its cascading approach to change. Unlike QCs, TQM places the responsibility for employee participation firmly in the hands of managers and supervisors.

Placing the responsibility for employee participation in the hands of supervisors may be a double edged sword. It overcomes the problem of QCs by integrating supervisors into the improvement process but it also has potential damaging consequences if

supervisors are reluctant to take on board the principles and practices of the TQM intervention. What this chapter highlights is the importance of supervisory behaviour pre intervention in affecting employee participation in the intervention. The subsequent chapter complements this analysis by looking at the antecedents of employee assessment of the intervention.

Chapter 9: Predictors of Employee Assessment of a TQM Intervention

9.1 Introduction

The previous chapter showed that the most important predictor of employee participation in TQM is supervisory participative style. In other words, supervisors who are participatively oriented in their style of managing prior to the intervention are more likely to involve their subordinates in the TQM intervention. However, participants in the intervention did not perceive their immediate supervisor as becoming significantly more participative between time 1 and time 2. Thus, the intervention has not significantly altered the style of managing for those supervisors who generally operate along participative oriented lines, rather, it has facilitated the cascading of the intervention to the lowest level in the organization.

This chapter continues this line of investigation by looking at the predictors of how individuals assess the intervention. From the previous chapters, the importance of assessment has been highlighted as having a significant impact. Overall, how individuals perceived the intervention was more significant in affecting attitudes than participation in the intervention per se. Given the importance of how an individual perceives and assesses the intervention, this chapter sets out to explore the antecedents, if any, of how individuals assess this particular organizational intervention. Two related but distinct questions are addressed: first, are there any attitudes that predispose individuals to respond positively to organizational interventions, in this case, TQM? Second, are the predictors of assessment the same as the predictors of participation?

Returning to the research on Quality Circles (QCs), considerable emphasis is placed on participation as the key mechanism in affecting subsequent attitudinal and performance outcomes. Rafaeli (1985) investigates the relationship between QC membership and outcomes such as job satisfaction, influence and job characteristics such as variety and autonomy. While the author does not include an assessment or evaluation of QC activities as an explanatory variable in linking membership to outcomes, there is a suggestion that some employees will react more positively to QC activities. Griffin's (1988) longitudinal analysis of the link between participation in QCs and job satisfaction, organizational commitment and performance outcomes found that there was an improvement in outcomes to the 18 month mark and a subsequent decrease. The author presents a possible explanation in that an increasingly mechanistic approach was adopted to and there was a decline in interest and enthusiasm for QCs.

A number of studies found that membership in QCs is related to perceived participation levels (Marks et al., 1986; Steel, Mento, Dilla, Ovalle, and Lloyd, 1985; Bruning and Liverpool, 1993). In one study, expected changes in perceived participation occurred in one group but not the other (Steel et al., 1982). A potential explanation put forward by the authors is that the group that did not change regarding perceived participation had not had enough time to develop. Therefore, the development and implementation of the QC process may be an important explanatory factor in the participation-outcome link. Also, management attitudes toward QCs could affect an individual's experience of QC activities (Bruning and Liverpool, 1993). It is widely accepted that individual differences are important moderators of how individuals respond to organizational stimuli (Staw, Bell and Clausen, 1986). Therefore, it is possible that differences may exist between participants in QCs in terms of how they assess or evaluate QCs.

What may be important in explaining the outcomes of QC activities is an individual's assessment of those activities. Steel and Jennings (1992) note that where no attitudinal change was found as a result of a QC intervention, this may be due to unmet expectations of participation. There may be other factors that may act as an inhibitor of attitudinal change resulting from QC participation, for example, lack of supervisory support for QCs or a lack of perceived benefit of participation.

It would seem that much of the research assumes that participation in QC activities is viewed in a positive manner by its participants. Relatedly, individuals who volunteer to participate in QC activities, prior to their participation, are more likely to view QC activities positively. The voluntary nature of membership in QCs has been widely documented (Cole, 1980). However, there has been little systematic investigation into the real extent of voluntary participation. Lillrank and Kano (1989) in their study of how QCs operate in Japan, highlight the use of informal pressure to ensure participation. Similarly, McArdle et al. (1995) note the use of covert encouragement to participate in QCs as part of TQM in their case study. The notions of voluntary participation and participation as a positive experience are very much interrelated. First, individuals who volunteer are more likely to view participation as positive. Second, individuals who participate may be disappointed due to unmet expectations and consequently withdraw their membership. Thus, the assumption of participation as a positive experience may only hold true if in fact participation is based on a true voluntary basis allowing individuals to withdraw as easily as they volunteered. In organizational settings, informal pressure may be placed on an individual by colleagues or by the immediate boss to participate and continue to participate. In this situation, an individual's assessment of QC activities may be more important that their participation in predicting subsequent attitudinal and performance changes.

Graham and Verma (1991) in their study set out to explain an individual's assessment of an employee participation program using a combination of dispositional and situational predictors. They propose that an individual's experience may or may not be satisfactory due to individual differences. Also, they argue that participation will be assessed positively only if the experience is a positive one. In their study, they do not attempt to link an individual's assessment of the program to subsequent outcomes such as job satisfaction and organizational commitment that are widely used in the QC studies and in empirical investigations of participation. Steel et al. (1985) in their study of the factors that influenced the success and failure of two QC programs found significant differences in participant assessment of QC activities between the successful and unsuccessful programs. Success was interpreted as having a positive impact on a range of attitudinal outcomes. Participants in the successful QC program reported higher managerial support for QC activities and greater satisfaction with the QC process than participants in the unsuccessful QC program.

Research on training has highlighted the importance of reactions to training activities in influencing posttraining attitudes (Tannenbaum and Yukl, 1992; Noe and Schmitt, 1986; Noe, 1986). Kirkpatrick's (1976) hierarchical model of training outcomes suggests that four outcomes need to be considered in evaluating training programs; trainees' reactions to the program, learning, behavioural change and individual and organizational performance. The model hypothesizes that each training outcome affects the next level in the hierarchy, for example, trainee reactions will have an important influence on learning and so forth. A number of training evaluation studies have provided some support for the hierarchical model (Latham, Wexley, and Pursell, 1975). Noe (1986) states that the strongest evidence is provided by Clement (1978) where trainee reactions had a causal impact on learning and learning had a significant influence on behaviour change. Tannenbaum and Yukl (1992) argue that individual

differences in attitudes and expectations may have a central role in influencing posttraining attitudes. In their study, they found support for the influence of training fulfillment, reactions and performance on posttraining attitudes. Training reactions were positively related to posttraining motivation and commitment (Tannenbaum and Yukl, 1992).

The empirical research on training suggests that it is not participation per se in the training activities that influence subsequent attitudes, the emphasis is on trainee assessment in terms of expectations, desires and reactions as having a greater impact on posttraining attitudes. Applying this to employee participation programs, an individual's assessment of the program may have a greater impact on subsequent attitudes than their participation per se. Consequently, rather than assuming that participation in, for example, a QC is a positive one based on voluntarism, it may be more worthwhile as in the study of Graham and Verma (1991) and Steel et al. (1985) to test this proposition.

This notion of employee assessment is highlighted quite recently by Marchington et al. (1994). At a broad level, they argue (in the context of employee involvement) that while employee involvement schemes are directed at employees, there is a noticeable lack of empirical research investigating employee attitudes and experiences of such schemes. More specifically, two points are made. First, the authors argue that undue emphasis is placed on individual demographic characteristics (age, gender, length of service) as a way of differentiating between individual response to these schemes. This is to the neglect of for example, the competitive environment or managerial style. Second, knowing if employees like or dislike the scheme is irrelevant unless one can ascertain *"why people hold those views, and what factors cause them to vary"* (p891). This chapter addresses to some extent the first point in that, not only are demographic

characteristics used but also employee attitudes on a range of dimensions (for example, organizational commitment) to predict employee responses. In view of the second issue raised, this study, in the specific context of TQM, investigates the factors which influence or predispose individuals to assessing the intervention in more favourable or unfavourable terms.

This chapter continues by outlining two models to be tested and their rationales. The first model replicates the model used in the previous chapter to predict employee participation in TQM. The second model includes an individual's prior experience or assessment of a participation program as a predictor of how individuals assess the TQM intervention. In addition, an individual's participation in the TQM intervention is also included as a predictor of assessment. Subsequent to presenting the models, the measures and analysis procedures are briefly presented, followed by a discussion of the results.

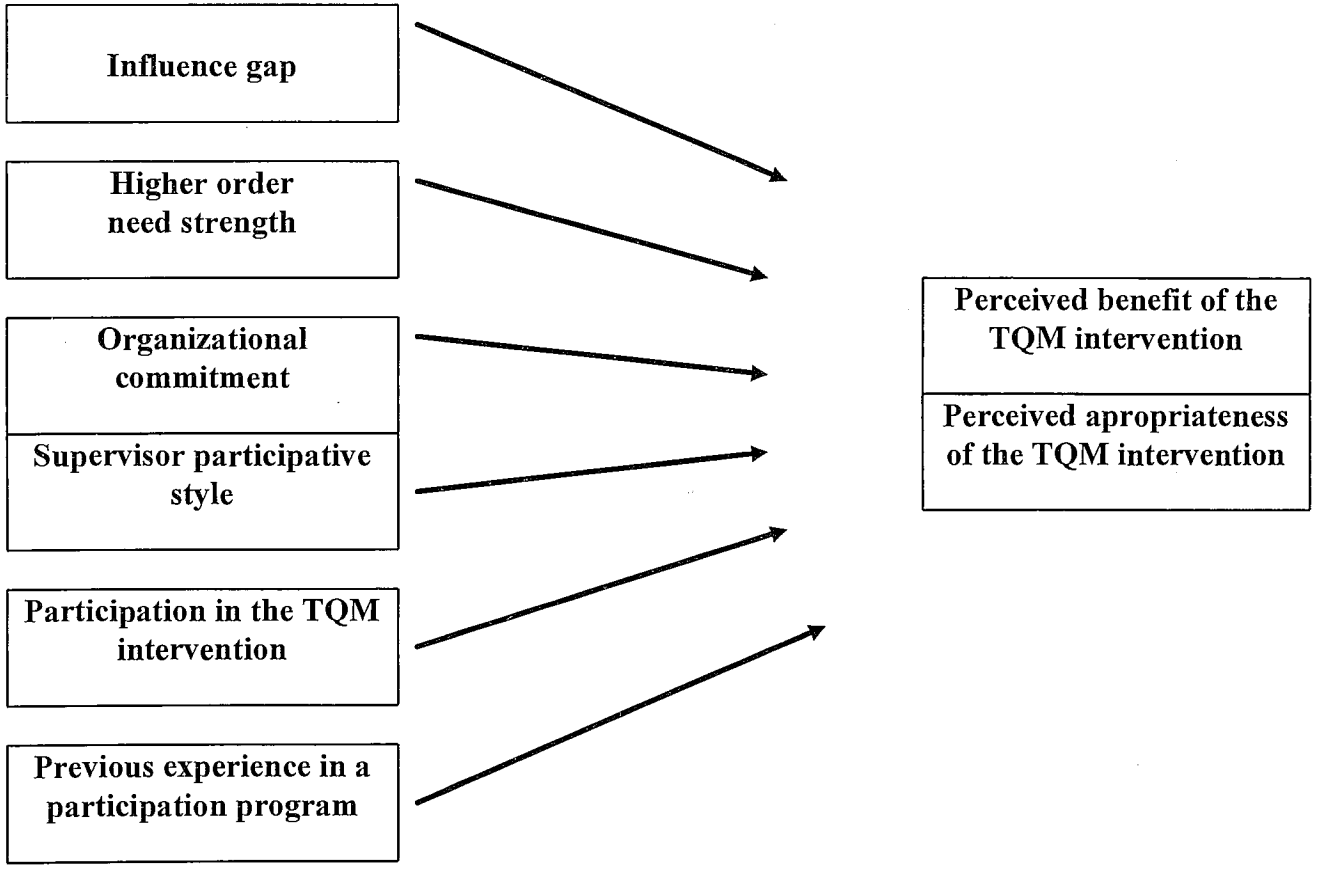
9.2 An hypothesized model of employee assessment of a TQM intervention

Two hypothesized models of employee assessment of the intervention are tested. The first mirrors the model outlined in the previous chapter for employee participation. This will allow a direct comparison of the predictors of participation in and assessment of the intervention. The variables include supervisor participative style, organizational commitment, higher order need strength and the gap between desired and perceived actual influence. These variables are hypothesized to have a positive effect on how an individual assesses the TQM intervention.

The second model (presented in Figure 9.1) includes two additional variables. The first additional variable taps an employee's previous experience or assessment of a participation program similar to what is widely known as QCs. The rationale for including this previous experience in the model is that an individual's prior experience with organizational interventions may have an impact on their assessment of future interventions. For example, an individual who participated in the previous QC program and who was very satisfied with its operation may be more likely to assess future participative interventions in a more positive manner.

At any given point in the implementation of a TQM intervention, there will be variation between employees as to their extent of participation in the intervention. From the previous chapter, it was shown that employees with a participative supervisor became involved more quickly and to a greater extent than employees who had a supervisor who was less participatively oriented. There will be employees who have decided that they will not participate or who are reluctant to do so and employees who are willing to participate but who have not yet had the opportunity to participate. Graham and Verma (1991) in their cross sectional study of the predictors of employee responses to employee participation programs (EPPs) found support for their hypotheses that the closer an individual is to membership and the longer their involvement in EPPs, the more positive their attitudes about EPPs. From this, one could hypothesize that the greater an individual's participation in the intervention, the more positive their assessment. Following from this, an individual's participation in the intervention is included in the model to investigate whether the degree of participation has an impact on the assessment of the intervention.

FIGURE 9.1: Full hypothesized model of employee assessment of a TQM intervention



9.3 Measures

All the measures used in the subsequent analysis have been discussed in previous chapters with one exception. This measure taps an employee's previous experience or assessment of a participation program. It is the creation of this measure that is now discussed.

Change interventions do not occur in an organizational vacuum and in approaching these interventions, individuals bring with them their previous experience (positive or negative) which may influence how they assess future interventions. As noted in chapter 2, at the commencement of this study, a small number of individuals were participating in a Continuous Improvement Group but overall, this initiative was rapidly deteriorating in terms of managerial and employee support. Consequently, individuals were broadly categorized as falling into one of three categories: presently participating, would like to participate and having no desire to participate in a Continuous Improvement Group. As discussed below, this three tier categorization was extended to five so as to include how individuals assessed their present participation or expectations of future participation.

Individuals were asked if they were presently participating in a Continuous Improvement Group (this is similar to QCs in that employees volunteer to participate and meet in work time to discuss work problems and suggest improvements). If individuals responded that they were participants, they were then asked to respond to a series of questions tapping their satisfaction with managerial support, recognition for improvements and the extent to which their participation was making use of their abilities and helping them in their work. This group was subdivided into those who

viewed their participation in a very positive manner and those who viewed it less positively.

The remaining individuals were asked if they would like to participate in a Continuous Improvement Group. Those who replied that they would were subdivided into two groups based on their replies to three questions tapping their anticipated benefit of participation in terms of helping them in their work, making use of their abilities and knowledge and the degree it would help them make improvements in their work area. Respondents were divided into two categories based on their perceived expectations; high expectations of the benefits of participation and lower expectations. Individuals who responded that they had no desire to participate in a Continuous Improvement Group were categorized as one group. Five groups were created based on an individual's prior experience or assessment of this participative program. The groups are as follows:

Groups: previous experience/ assessment at time 1

1 - Not participating and has no desire to participate

2 - Not participating but has a desire to participate with low expectations of the benefits

3 - Not participating but has a desire to participate with high expectations of the benefits

4 - Participating but which is not viewed very positively

5 - Participating which is viewed positively

9.4 Analysis procedures

The two models were tested separately using OLS regression and controlling for the usual set of demographic factors. For the first model, the variables included were the same as in the model predicting participation in the intervention. As previously noted, in the second model, two additional predictors were included. The first additional predictor was an individual's prior assessment or experience of participative programs. Dummy variables were created that correspond to the groups outlined in the previous section. The reference category used was group 1; those individuals who at time 1 were not participating and had no desire to participate in Continuous Improvement Groups. Present participation in the TQM intervention was also included in this model. This predictor differs from the remaining predictors in that it was measured at time 2 while the others were measured at time 1. Similar to the previous chapter, the analysis is conducted on the sample of employees at site 1.

9.5 Results

Table 9.1 presents the results of the initial model that mirrors the model tested in the previous chapter on employee participation in the TQM intervention.

Table 9.1: Predictors of employee assessment of a TQM intervention (using same predictors as for employee participation)

Predictors (Time 1)	TIME 2	
	Perceived benefit of TQM intervention	Perceived appropriateness of TQM intervention
Job Tenure	-.13	-.12
Age	.03	.06
Gender	-.01	.03
Length of service	-.03	-.03
Job Title 2	.09	-.15**
Job Title 3	.13	-.03
Supervisor participative style	.19**	.30***
Organizational commitment	.17**	.30***
Higher order need strength	.11	.14+
Influence gap	.03	.06
Adjusted R^2	.09	.26
N	166	166

+ = p<.1 ** = p<.05 *** = p<.01

The results show that supervisor participative style and organizational commitment prior to the intervention are significant predictors of perceived benefit and appropriateness of the intervention. In addition, higher order need strength was found to be significant (at 10% level) in predicting an individual's assessment of the appropriateness of the intervention. The influence gap; that is, the discrepancy between desired and perceived actual influence, was not found to significantly affect how individuals assessed the intervention.

In comparing the predictors of participation with the predictors of assessment, there is only one common predictor, that of supervisory participative style. Organizational commitment was not found to significantly affect an individual's participation in the intervention but it had a significant effect on how individuals assessed the intervention.

Table 9.2 presents the results of the full model that includes present participation in the intervention and previous assessment of a participative program.

Table 9.2: Predictors of employee assessment of a TQM intervention (full model)

Predictors (Time 1)	TIME 2	
	Perceived benefit of TQM intervention	Perceived appropriateness of TQM intervention
Job Tenure	-.14^{+}	-.14**
Age	.02	.04
Gender	.05	.09
Length of service	.06	.06
Job Title 2	.02	-.22**
Job Title 3	.01	-.15**
Supervisor participative style	.04	.18**
Organizational commitment	.13^{+}	.26***
Higher order need strength	.04	.09
Influence gap	-.02	.01
Participation in TQM†	.38***	.33***
Previous participation 2	.12	.17**
Previous participation 3	.13	.15**
Previous participation 4	.10	.14**
Previous participation 5	.16**	.10
Adjusted R^2	.22	.37
N	164	164

$^{+}$ = p<.1 ** = p<.05 *** = p<.01

† measured at time 2

Participation in the intervention has a significant effect on assessment of the intervention. In other words, the more an individual participates in the intervention, the more positive the assessment. Organizational commitment continues to be significant in affecting how individuals assess the intervention. Previous experience was also found to have a significant effect. In the case of perceived benefit, group 5 are more likely to view the intervention as providing benefit. This group held positive views on their previous experience in a participation program. In addition, previous experience played a significant role in affecting whether individuals deemed the intervention as appropriate.

9.6 Discussion

Predictors of participation vs. assessment

One of the significant findings is that the predictors of assessment do not mirror the predictors of participation discussed in the previous chapter. The difference is not surprising given the nature of participation versus assessment; that is, behaviour versus attitude. As discussed in the previous chapter, employee participation is dependent upon the actions and behaviour of the supervisor. Thus, unless a supervisor involves his/her subordinates in the intervention, there is no alternative method for employees to participate. While employee behaviour (i.e. participation) is dependent upon the behaviour of the supervisor, employee attitudes (toward the intervention) are influenced not only by the behaviour of the supervisor but also by other attitudes held by employees.

This result highlights the difference between QCs and TQM. QCs rely on voluntary participation from employees and give a minority role to supervisors; that is,

supervisors are given the responsibility to oversee QC activities but are not allocated parallel authority. Consequently, QCs can operate outside the sphere of supervisory influence in determining their own agenda without being required to consider the priorities of the supervisor. This limited role allocated to the supervisors has been previously highlighted as a stumbling block to the QC grass roots approach to change (Collard and Dale, 1989; Hill, 1991b). QCs in Japan are firmly integrated into TQM and are considered part of an organization-wide effort of quality improvement and change (Lillrank and Kano, 1989). Thus, in theory, TQM overcomes the limited role assigned to supervisors in QC activities. Supervisors are allocated the role of cascading the principles and practices of TQM and of integrating quality improvement as a core activity of the organization.

TQM places greater emphasis on including all employees (Lawler, 1994) with the notion of "total involvement" (Oakland, 1989). This raises the question of the nature of voluntary participation of employees in TQM. One could argue that as TQM places supervisors in a crucial position regarding implementing and sustaining quality improvements at the lower levels in the organization and in conjunction with the proximity of the supervisor to employees, it may be more difficult to operate employee participation on a voluntary basis as advocated by numerous writers (Juran, 1989; Ishikawa, 1985). The vested interest of the supervisor in succeeding (for whatever reason, the avoidance of sanctions or the pursuance of rewards) may lead to informal pressure being placed on subordinates to participate; voluntary participation being espoused but not practised. This may very well be a contributing factor to the lack of impact of participation on the core outcomes of TQM and also highlight why, in this case, assessment is of greater importance. Thus, while TQM overcomes the "problematic" role of supervisors in QCs, it raises the issue of voluntary participation

of employees but moreso, it places the responsibility of quality improvement at the lowest level firmly on the supervisor.

Organizational commitment

In comparing the predictors of participation in (chapter 8) and assessment of the intervention, organizational commitment was found to have a significant effect on an individual's assessment but not their participation. What the results indicate is that individuals who are more committed to the organization prior to the intervention are more likely to assess the intervention as being appropriate and as providing benefit. In addition, organizational commitment seems to have a dual role in being an antecedent and an outcome of the intervention.

An individual's identification with the organization and willingness to exert effort on behalf of the organization may positively colour an individual's assessment of organizational activities. The previous chapter showed that commitment levels of participants significantly increased while the level of non participants remained stable. This chapter has shown that organizational commitment is an antecedent of how individuals assess the TQM intervention. This is consistent with the proposition put forward by Eisenberger et al. (1990) that affective attachment to the organization would create *"evaluation biases in judging the organization's actions and characteristics"* (p57).

Treating organizational commitment as an antecedent and an outcome is consistent with previous research on training (Gist, 1987; Latham, 1989; Tannenbaum and Yukl, 1992). Tannenbaum and Yukl (1992) argue that organizational commitment is likely to influence whether an individual views the training as useful to themselves and the organization. In terms of organizational commitment as an outcome, employees may

view training as representing the willingness of the organization to invest in them, and reciprocate by increasing their affective attachment to the organization.

A similar explanation is put forward to account for the role of organizational commitment as an antecedent and an outcome of the TQM intervention. If TQM is viewed as a way to ensure the future prosperity of the organization and is presented as something an organization needs to do, individuals who are highly committed to the organization may be more likely to view the intervention as providing benefit; ensuring the future success of the organization and as a consequence providing an economic benefit for the individual of continued employment. Alternatively, or in addition, an individual who is strongly committed to the organization may be more likely to identify with the core values of the organization. If a particular organizational intervention is broadly consistent or does not represent a radical departure with those values, an individual may be more likely to view the intervention in positive terms. Using cognitive self concept theories, Reger et al. (1994) address why beneficial change is often resisted by loyal members who want what is best for the organization. This perspective suggests that organizational initiatives which radically depart from the organization's past fail due to members' cognitive structures which constrain their understanding and support for new initiatives.

Higher order need strength

It was hypothesized that an individual's higher order need strength would have a positive impact on how the intervention was assessed. Although the beta coefficients are quite high (significant at the 10% level for perceived appropriateness), the effect of higher order need strength was not found to have a strong effect. As discussed in the previous chapter, this finding goes against some previous research (Marks et al., 1986) but is also consistent with other findings (Griffin, 1988).

Influence gap

The influence gap did not have a significant impact on perceived benefit or appropriateness of the intervention. Individuals who have a greater discrepancy between their desired and actual influence prior to the intervention did not perceive the intervention as more appropriate or beneficial. This is contrary to the findings of Graham and Verma (1991) where individuals reporting the highest affect level towards EPPs were individuals who were inactive organizational citizens or who perceived the greatest participation gap. Two possible explanation are put forward for the lack of significant effect of influence gap on perceived benefit and appropriateness of the intervention. First, higher order need strength may be suppressing the effect of the influence gap. One could plausibly argue that individuals with strong growth needs would desire the opportunity for greater influence in order to satisfy a need for achievement through work. Second, the measure of influence gap is a single item measure unlike Graham and Verma's (1991) twelve item measure. Consequently, the lack of effect may be due to the limited scope of the measure.

Prior experience of a participative program

Up to now, the discussion has focused on the difference between the predictors of participation in and assessment of the intervention and why this may be the case. The second model contained two additional predictors that are worth discussing commencing with an individual's prior experience of a participative program. This predictor is important for two reasons. First, individuals carry with them prior experiences of organizational activities which influence their interpretation of future events. Second, it has been documented that QC type participative programs are transitional mechanisms (Lawler and Mohrman, 1985) in the search for a more effective way of gaining quality improvements. Hill (1991b) reports that of the thirteen organizations that experimented with QCs, seven continued to make provisions for

participative quality improvement primarily through the adoption of TQM. Consequently, this raises an issue of whether experimentation with a particular participative mechanism at one point has an effect on subsequent participative interventions in terms of employee assessment.

The results show that previous experience or assessment does have an impact on perceived benefit and appropriateness of the intervention. Individuals who had prior positive experience with Continuous Improvement Groups are more likely to assess the intervention in positive terms regarding perceived benefit. In predicting perceived appropriateness of the intervention, compared to the group who reported no desire to participate at time 1, the remaining groups (except those who had a positive experience at time 1) viewed the intervention as being more appropriate. Thus, previous experience or assessment of a participative program seems to influence how individuals assess future interventions. Certainly, in the short term, it would seem that individuals do carry with them their previous experience which has some influence on how they assess future organizational interventions. This is consistent with the argument presented by Marchington et al. (1994) who suggest among other things, that employees attitudes to employee involvement programs are dependent on their past experience of such schemes. However, whether this holds true in the longer term is another question.

Participation in the intervention

A substantial number of studies have investigated the link between participation in QCs and various attitudinal and in fewer cases performance outcomes (Griffin, 1988; Rafaeli, 1985; Marks et al., 1986; Head et al., 1986). The emphasis on the direct participation-outcome linkage has been to the neglect of an assessment of the participation activity, in this case, QCs. Very few studies have adopted or tested a

participation-assessment-outcome linkage. Graham and Verma (1991) in their study of EPPs and the affect toward them found that proximity to and duration of involvement in an active EPP were strongly associated with EPP affect. As such they are primarily testing the participation-assessment linkage. In the context of this study, several questions are raised. Are there factors, other than participation, that affect an individual's assessment of the intervention? Does an individual's participation in the intervention eliminate the effects of previous experience in their assessment of the intervention?

Participation in the intervention was found to have a significant positive effect on the two assessment variables. Thus, the more an individual participates in the intervention, the greater the perceived benefit and appropriateness of the intervention. This finding is broadly consistent with that of Graham and Verma's (1991) but goes further in that the greater the participation, the more positive the assessment. However, as respondents' degree of participation was measured at the same time as their assessment of the intervention, it is not possible to ascertain whether participation leads to assessment or whether the reverse relationship holds true. It is possible that participation and assessment are interrelated; that is, an individual, based on information about the aims and purpose of the intervention, may initially make an assessment which may subsequently alter based on his/her involvement in the intervention. Indeed, it is quite plausible that individual assessment of the intervention is not a stable characteristic and may alter depending on how the intervention develops and how the individual reacts to this.

Thus, while participation has a significant impact on how individuals assessed the intervention, it is not the sole predictor. From a methodological stance, it is important to remember that participation was measured at time 2. Consequently, from this, one

could argue that its effect may be inflated in relation to the remaining predictors measured at time 1. However, other attitudes prior to the intervention also have a significant effect; an individual's attitude toward the organization, perception of supervisory behaviour and previous assessment of a participative program.

To summarise, the findings from this and the previous chapter highlight several issues. First, the predictors of participation in and assessment of the intervention are not the same. Employee participation in the intervention is predicated on the behaviour of the supervisor. In other words, the intervention has cascaded where the supervisor(s) have a participative style of managing and not because there has been a significant shift in the participative style of the supervisors. In contrast, employee assessment is also influenced by their commitment to the organization prior to the intervention. Second, a potential explanation put forward for the lack of predictive power of participation on subsequent attitudes may be the result of informal pressure being applied to employees to participate. Due to the proximity of supervisors to employees and their perceived authority, employee participation may be subject to some degree of informal pressure. Finally, while participation in the intervention has a significant positive effect on assessment, it is not the sole significant influence. Rather, employee assessment of the intervention is influenced by a range of diverse factors to include an individual's prior experience and assessment of a participative program.

9.7 Conclusions

This chapter set out to investigate the predictors of assessment of the TQM intervention. Predictors of participation in and assessment of the intervention were found to be different. They did share a common predictor, that of supervisor participative style prior to the intervention. The results indicated that organizational

commitment prior to the intervention had a significant positive effect on how individuals assessed the intervention.

The difference in the predictors between employee participation and assessment may shed light on why employee participation does not have a significant effect on any of the TQM outcomes measured here. As discussed in chapter 8, employee participation is dependent upon the actions of the supervisor. What is unknown is the degree to which informal pressure is placed on the individual by his/her immediate boss or colleagues to participate. Therefore, participation in the intervention may not be based on a true voluntary basis. If this is the case, the assumption that participation is a positive experience may not hold true. Consequently, how employees assess or judge the intervention is more important in affecting attitudinal and behavioural change.

Present participation in the intervention did have a significant effect on how the intervention was assessed. However, it was not the only significant influence. An individual's prior experience of participative programs was found to have a significant effect on their assessment of the present intervention.

Up to this point, the focus of investigation has been at the level of employees. The subsequent chapter takes the analysis a step further by concentrating on supervisors/managers.

Chapter 10: Supervisory Behaviour

10.1 Introduction

The emphasis of the thesis so far has been on employees. Two lines of investigation were pursued: evaluating the impact of the TQM intervention on employee attitudes and; predicting employee participation in and reaction to the intervention. Throughout this investigation, supervisory behaviour was highlighted as having an important influence in affecting employee attitudes. Supervisor participative style and supervisor commitment to quality respectively, were found to have a significant effect on team orientation and commitment to improvement. Subsequently, it was shown that the participative style of the supervisor was an important determinant of employee participation in the TQM intervention. In a similar vein, supervisor participative style was highlighted as having some influence on how employees reacted to the intervention. Up to this point, the thesis has not addressed supervisory behaviour. In light of the importance of supervisory attitudes and behaviour in affecting employee attitudes and behaviour, this chapter examines the predictors of supervisory participative style and commitment to quality.

The importance of supervisory behaviour has long been recognized as having a major influence in organizational life. An abundance of empirical research exists detailing the impact and importance of the behaviour of those in the higher echelons on a range of organizational characteristics, processes and outcomes. The behaviour of supervisors can be thought of, in broad terms, of having an effect on the behaviour and attitudes of employees in their everyday activities and also play a pivotal role in an organization's attempt to change. The work of classic human relations theorists asserted that leadership assumptions of managers and their consequent processes were primary

determinants of climate which in turn, affected individual behaviour (Likert, 1967; McGregor, 1960). Further developments on the impact of various leadership styles on employee behaviour have been widely researched and documented.

The emphasis of human relations theorists is similar to that of transactional leadership in focusing on leadership at the lower hierarchical levels. In contrast, a more recent strand of the leadership research has focused on transformational leadership which emphasizes the communication of values and the implementation of a vision. Transformational leadership processes have the potential to enhance followers' work oriented values to be congruent with those of the group or organization (Burns, 1978; Conger and Kanungo, 1987). Waldman (1994) argues that several processes are likely to operate; one process is a clear and appealing vision. In addition, the leader acts as a role model for the espoused values. This latter process, leading by example, is consistent with the "Pygmalion effect" (Livingston, 1969; Eden, 1984). This effect relies on the role expectations of the leader affecting the behaviour of followers. In other words, a leader's expectations of subordinate behaviour is communicated to them through the behaviour of the supervisor and is hypothesized to affect subordinate behaviour. Scott and Bruce (1994) provide support for the Pygmalion effect in the context of innovation; that is, the role expectations of a supervisor in relation to subordinate innovation had an effect on the innovative behaviour of subordinates.

In addition to the effect of role modeling, it has been asserted that the supervisor is a potentially powerful source of social information (Griffin, 1983). In the context of task attributes, Griffin (1983) found that employee perceptions of task attributes and affective responses were significantly influenced by both the objective task changes and the informational cues provided by the supervisor. Thus, supervisors may affect employee attitudes through their own behaviour and through the informational cues

they provide as to organizational processes and events. In investigating supervisory attitudes toward employee involvement programs, Klein (1984) found that supervisors rarely exhibited overt resistance to top management initiatives. Occasionally, supervisors criticized the programs with peers and subordinates but more often, they remain silent or communicate mild enthusiasm. This is interpreted by subordinates as a lack of support for the program.

In relation to organizational change programs, individuals in managerial positions have an important role to play in affecting change. Whether it be cultural change or changes in the structuring of work, commitment from management is a vital ingredient for successful change efforts (Schein, 1985; Walton, 1977). It has also been asserted that the commitment of supervisors is essential if meaningful changes are to occur in the workplace (Klein, 1984). The discussion so far, at a general level, has highlighted the importance of those in supervisory positions in affecting the attitudes, behaviour and perceptions of employees. This is very much applicable in the context of TQM. The objective of TQM is to change the attitudes and behaviour of management and subsequently, the attitudes and behaviour of employees. In terms of process of change, the initial focus is on changing individual attitudes and behaviour within the managerial hierarchy and using this change as a mechanism for changing the attitudes and behaviour of employees. The prescription from the TQM proponents is quite clear, a change in management attitudes and behaviour will lead to a change at employee levels and a lack of change at managerial levels will presumably lead to a lack of change at employee levels.

Management commitment to TQM has been widely documented and espoused as a necessary ingredient for the success of TQM (Deming, 1986; Juran, 1989; Hill, 1995). Hill (1995) argues that top management is the key champion of TQM within the

organization reflecting TQM's strategic importance. They set the quality priorities, establish and facilitate an appropriate culture, provide resources and lead by example. Waldman (1994) argues that the concept of transformational leadership appears to be consistent with the prescription for managers from the quality proponents (Deming, 1986; Juran, 1989; Sashkin and Kiser, 1993). He specifically asserts that transformational leadership may be the mechanism by which managers can affect individual values in order to achieve teamwork and continuous improvement. Thus, the onus is on management to change and provide role models for other organizational members to follow.

In addition, TQM requires a change in managerial style. As Wilkinson (1994) indicates, there are common underlying themes between HRM and TQM to include a view of employees aligned to McGregor's Theory Y. Wilkinson and Willmott (1995) note that TQM requires a shift from Theory X to Theory Y, in the pursuit of achieving quality (Willmott, 1992;1993) and not for individual self actualization à la McGregor (although this may occur in the process of achieving quality, it is not the objective). Hill (1991b) argues that the task for top management is to create a culture that facilitates participation of all employees in the pursuit of continuous improvement. Underlying this participation is a cascading effect; middle managers and supervisors are allowed greater influence over the decisions that affect them and they, in turn, adopt a more participative approach thus providing a climate for employees to participate in the improvement process.

In terms of implementation, TQM starts at the top of the organization and cascades down the organization. Consequently, the first line supervisor / manager plays a critical role in instilling TQM values at employee levels. Moreso, as the supervisors are the

salient representative of management in the eyes of those at the bottom of the hierarchy, they play a key role in setting the quality agenda at the bottom of the organization.

Given the centrality of change in managerial attitudes and behaviour to the TQM process, the first issue that warrants examination is the change, if any, that has occurred within the entire group of managers / supervisors at the site (n=51). Subsequently, the chapter sets out to investigate the predictors of supervisory participative style and commitment to quality as these have been portrayed as two key dimensions of supervisory behaviour in the context of TQM. The focus here is on first line supervisors / managers (n=27). As previous chapters have shown, it is an employee's immediate supervisor that is the most salient in affecting employee attitudes and behaviour.

This chapter begins by looking at the change that has occurred between time 1 and time 2 in the entire group of managers / supervisors. This group has been directly involved in the intervention and therefore it was not possible to establish a post hoc control group. This provides the context in which the predictors of the two dimensions of behaviour of first line managers / supervisors may be examined. The rationale for concentrating on first line managers / supervisors is that they are more proximal to employees. To do this, an hypothesized model of supervisor participative style and commitment to quality is outlined and subsequently tested. Due to the diversity of predictors, the measures and analysis procedures are discussed in detail. A presentation and discussion of the results follows.

10.2 Descriptive statistics

The aim of this section is to examine the change that has occurred over time in the entire group of supervisors / managers. First, the results of the paired sample t-tests presented in Table 10.1 will provide an overall picture of the extent and direction of change that has occurred over time in this group. Subsequently, Table 10.2 presents the results of the independent sample t-tests between supervisors / managers and employees at site 1. This permits a comparison of the change that has occurred within the supervisory/ managerial group with that which has occurred within the group of employees.

Table 10.1: Paired sample t-tests for the group of managers/supervisors at site 1

Variables	Time 1		Time 2		Change Scores	
(N=51) Supervisors / managers	Mean	(S.D)	Mean	(S.D)	Mean	(S.D)
General orientation to quality	6.01	(0.57)	6.17	(0.53)	.16	(0.26)***
Improvement as part of the job	5.92	(0.84)	5.98	(0.84)	.06	(0.19)**
Intrinsic motivation	6.10	(0.64)	6.16	(0.50)	.06	(0.57)
Higher Order Need Strength	6.01	(0.84)	6.18	(0.52)	.17	(0.90)
Quality awareness	6.07	(0.57)	6.09	(0.57)	.02	(0.70)
Organizational commitment	5.32	(0.75)	5.58	(0.80)	.26	(0.69)***
Theory X	4.02	(1.12)	3.84	(1.13)	-.19	(0.98)
Theory Y	5.08	(0.88)	5.39	(0.63)	.31	(0.64)***
Trust in colleagues	5.46	(0.85)	5.49	(0.89)	.03	(0.80)
Immediate superior participative style	4.95	(1.19)	5.02	(1.26)	.07	(1.37)
Immediate superior commitment to quality	4.87	(1.23)	5.01	(1.21)	.14	(1.13)
Management commitment to quality	5.18	(1.06)	5.42	(0.88)	.24	(0.95)*

* T-test difference in means between Time 1 and Time 2 significant at < than .1 level
** T-test difference in means between Time 1 and Time 2 significant at < than .05 level
*** T-test difference in means between Time 1 and Time 2 significant at < than .01 level

Overall, the results[1] indicate that changes over time have been in the hypothesized direction. There has been a significant positive change in general orientation to quality,

[1] Paired sample t-tests were also conducted on 1st level supervisors / managers and the results were broadly similar.

improvement as part of the job, organizational commitment, subscription to a Theory Y view of employees and to a lesser extent, perceived management commitment to quality. Supervisory subscription to Theory X has shifted in a negative direction as would be expected although this is not significant.

An interesting result is the lack of significant change in supervisors' / managers perceptions of the behaviour of their immediate boss. In other words, there has not been a significant positive shift in supervisors' perception of their superior's participative style and commitment to quality. Given the cascading process, one would expect a positive change in the way supervisors viewed the behaviour of their immediate boss. Overall, this has not occurred. One explanation may be the implementation process. As discussed in chapter 2, the cascading process was uneven within the group of managers/ supervisors. Furthermore, some individuals resisted cascading the intervention to their subordinates. Consequently, it is not surprising that a significant positive change has not occurred within this group as a whole.

Overall, the results indicate that some significant change has occurred within this group between time 1 and time 2. However, from these results, it is not possible to ascertain whether this change is due directly to the intervention.

In view of the proposition that change at employee levels is dependent upon change within the managerial hierarchy, the next step would be to compare the group of supervisors/ managers with the group of employees. Table 10.2 presents the results.

Table 10.2: Independent t-tests between supervisors/managers and employees at site 1

Variables (N=51) Supervisors / managers	Time 1 Mean	(S.D)	Time 2 Mean	(S.D)	Change scores Mean	(S.D)
General orientation to quality	6.01	(0.57)+++	6.17	(0.53)+++	.16	(0.26)***
Improvement as part of the job	5.92	(0.84)+++	5.98	(0.84)+++	.06	(0.19)**+
Intrinsic motivation	6.10	(0.64)	6.16	(0.50)	.06	(0.57)
Higher Order Need Strength	6.01	(0.84)	6.18	(0.52)+++	.18	(0.90)
Quality awareness	6.07	(0.57)	6.09	(0.57)	.02	(0.70)
Organizational commitment	5.32	(0.75)	5.58	(0.80)	.26	(0.69)***
Trust in colleagues	5.46	(0.84)	5.49	(0.89)	.03	(0.80)
Immediate superior participative style	4.95	(1.19)	5.02	(1.26)	.07	(1.37)
Immediate superior commitment to quality	4.87	(1.23)	5.01	(1.21)	.14	(1.13)
Management commitment to quality	5.18	(1.06)	5.42	(0.88)	.24	(0.95)*
Improvement in commitment to quality			4.80	(0.88)		
Improvement in quality climate			5.26	(0.80)+++		
Perceived benefit of intervention			5.09	(1.07)+++		
Appropriateness of intervention			5.41	(0.90)+++		
Reinforcement of intervention			4.75	(1.10)		

Variables (N=165) Employees	Time 1 Mean	(S.D)	Time 2 Mean	(S.D)	Change scores Mean	(S.D)
General orientation to quality	5.62	(0.82)+++	5.78	(0.75)+++	.16	(0.46)***
Improvement as part of the job	4.45	(1.18)+++	4.58	(1.19)+++	.13	(0.53)***+
Intrinsic motivation	6.20	(0.65)	6.24	(0.68)	.04	(0.66)
Higher Order Need Strength	5.87	(0.81)	5.88	(0.92)+++	.01	(0.88)
Quality awareness	5.99	(0.67)	5.95	(0.65)	-.04	(0.59)
Organizational commitment	5.32	(0.98)	5.51	(1.00)	.19	(0.74)***
Trust in colleagues	5.67	(0.93)	5.68	(0.91)	.01	(0.76)
Immediate superior participative style	4.98	(1.11)	5.15	(1.09)	.17	(1.07)**
Immediate superior commitment to quality	4.91	(1.25)	5.04	(1.19)	.13	(1.12)
Management commitment to quality	5.10	(1.01)	5.27	(1.03)	.17	(0.86)**
Improvement in commitment to quality			4.84	(1.06)		
Improvement in quality climate			4.63	(1.22)+++		
Perceived benefit of intervention			4.20	(1.31)+++		
Appropriateness of intervention			4.99	(1.26)+++		
Reinforcement of intervention			4.55	(1.27)		

* T-test difference in means between Time 1 and Time 2 significant at < than .1 level
** T-test difference in means between Time 1 and Time 2 significant at < than .05 level
*** T-test difference in means between Time 1 and Time 2 significant at < than .01 level
+ T-test difference in means between supervisors and employees significant at < than .1 level
++ T-test difference in means between supervisors and employees significant at < than .05 level
+++ T-test difference in means between supervisors and employees significant at < than .01 level

In comparing the two groups; supervisors and employees, several interesting findings emerge. First, the significant changes that have occurred in the group of supervisors have been mirrored in the group of employees. In both groups, there has been significant positive changes in general orientation to quality, improvement as part of the job, organizational commitment and perceived management commitment to quality. At time 1, supervisors were not found to be significantly different from employees on a range of measures (the two dimensions of commitment to improvement are the exception). Furthermore, at time 2, there were no significant differences found between supervisors and employees in their perception of the behaviour of their immediate boss regarding participative style or commitment to quality. This may indicate an uneven cascading effect where rather than cascading throughout the managerial hierarchy prior to the lower levels, the cascading approach has occurred throughout certain parts of the organization but not others. Further support for this is found in the absence of any significant difference between employees and supervisors in their perception of their immediate boss reinforcing the intervention. One could reasonably expect that if the effects of the intervention cascaded throughout the managerial hierarchy in the initial instance, then, managers/supervisors would be significantly more positive in their perception of reinforcement of the intervention by their immediate boss. This has not occurred.

In terms of the TQM intervention, a more optimistic result is the perceived differences between the two groups in their assessment of the intervention, with supervisors being more positive. Given the time span between the intervention and the collection of data, the group of supervisors would be more proximal to the intervention and would have greater experience of it, consequently, this result is not surprising.

To summarise, significant change has occurred between time 1 and time 2 in the group of managers/ supervisor along some dimensions. From a TQM perspective, one could argue that a significant positive change in Theory Y and a parallel (although not significant) one in Theory X is a move in the right direction and possibly a requirement for subsequent behavioural change. An interesting finding is that the significant positive changes that occurred over time in the group of managers/supervisors are also found in the group of employees. Previous research found that managerial attitudes and behaviour after human relations training did not alter in the short term but significantly changed after 18 months (Hand, Richards and Slocum, 1973). In this study, it may be the case that supervisory attitudes and behaviour need to be stimulated or reinforced by other mechanisms in the organization in order to take hold. Consequently, it cannot be ruled out that in the longer term, supervisory attitudes and behaviour may alter significantly along a wider range of dimensions.

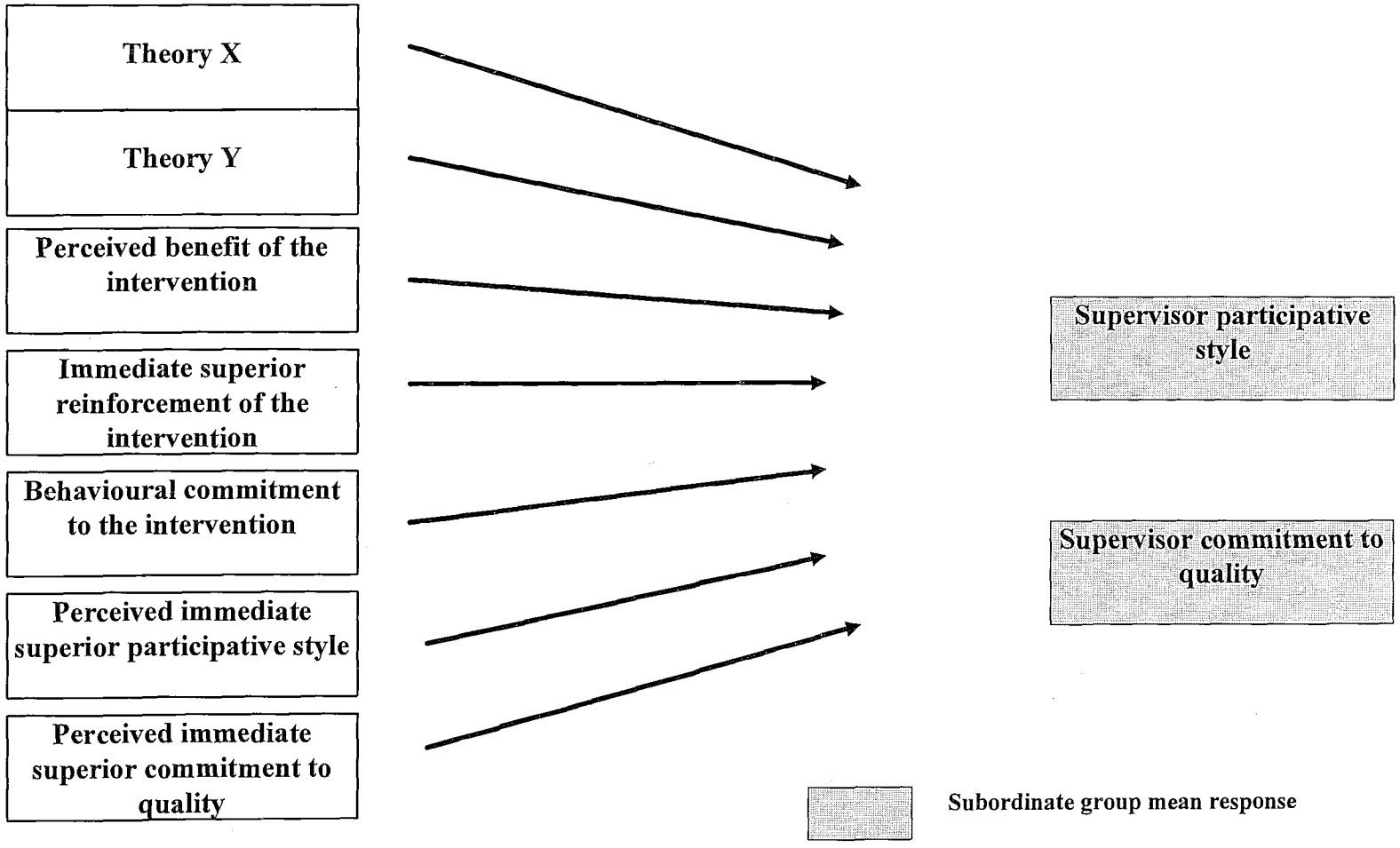
Adopting a critical perspective, one could argue that little change has occurred between time 1 and time 2. However, the interpretation of the extent of change that has occurred is dependent upon how much change could be expected given the nature of the intervention and the way it was implemented. This issue is pursued in the concluding chapter.

10.3 An hypothesized model of supervisor participative style and commitment to quality

The hypothesized model of supervisor participative style and commitment to quality is presented in Figure 10.1. The predictors of supervisor participative style and commitment to quality can be grouped into the following two broad categories: supervisor attitudes and supervisor perceptions of their immediate boss (perceived superior reinforcement of the intervention, perceived superior participative style and commitment to quality). The discussion begins with supervisory attitudes.

Supervisory attitudes This category contains four predictors: Theory X and Y assumptions, perceived benefit of the intervention and behavioural commitment to the intervention. Theory Y and X are hypothesized to have a positive and negative impact respectively, on supervisors' participative style. While McGregor's (1960, 1967) conceptualization of Theory X and Y managerial philosophies has exerted considerable influence on managerial thinking, there is a paucity of empirical research linking these views to managerial behaviour. McGregor (1960) believed that a manager's personal beliefs about the nature of man exert significant influence over a manager's actual behaviour when directing others. Managers accepting a Theory X view would be more likely to deal with subordinates in an authoritative manner and are unlikely to behave in a participative fashion. On the contrary, managers accepting a Theory Y view are more likely to deal with subordinates in a participative manner reflecting the broad assumption that employees can make an important contribution, are willing to accept responsibility and are capable of exercising autonomy.

FIGURE 10.1: Hypothesized model of supervisor participative style and commitment to quality



Fiman (1973) investigated the link between supervisory Theory X and Y assumptions and their behaviour. He found a negative relationship between Theory X assumptions, consideration and Theory Y behaviours, and a positive link between Theory X assumptions and initiating structure behaviour. The relationship between Theory Y assumptions and the measured behaviours was the exact opposite of that found for Theory X assumptions. These relationships were found using subordinate perceptions of supervisors' Theory X and Y assumptions[2] and subordinate perceptions of their supervisors' behaviour. However, Fiman reports that these relationships were altogether less clear when supervisors' own responses were used to represent Theory X and Y assumptions and consideration, initiating structure and Theory Y behaviours.

McGregor (1967) stated that Theory X and Y were not opposite ends of the same continuum but rather different cosmologies. Accordingly, one would not expect to find significant positive or negative correlation between Theory X and Y. In this study, a significant negative correlation of -.40 was found and this result is consistent with previous findings (see for example, Jacoby and Terborg who report a negative correlation of -.55). Thus, this may question the idea that Theory X and Y are distinct and separate set of assumptions. Rather, it would seem that they are bipolar.

Supervisory behavioural commitment to the intervention is also hypothesized to have a positive impact on supervisory participative style. In other words, the more committed the supervisors are to the intervention, the more participative their style of managing. The rationale for this is twofold. First, behavioural commitment to the intervention taps supervisory perceptions of the extent to which they keep subordinates well informed and involved in the intervention. Consequently, supervisors who involve

[2] The piloting of the questionnaire in my research included subordinate perceptions of their supervisors' Theory X and Y assumptions. Respondents reported difficulty in answering these statements and they were subsequently omitted from the questionnaire.

subordinates in the intervention are displaying a participative oriented behaviour which should be perceived by subordinates as such. Second, one of the objectives of the intervention is a shift toward a greater participative style and thus, supervisors who are behaviourally practising the principles of the intervention and who view it as an important part of their job are more likely to be perceived as participative. Overall, supervisory reported behavioural commitment to the intervention is hypothesized to have a positive impact on how employees perceive the participative behaviour of the supervisor.

In addition, perceived benefit of the intervention is hypothesized to have a positive impact on the participative style of the supervisor. In other words, the greater the perceived benefit of the intervention, the greater the likelihood that supervisors will shift toward a more participative style of managing. Hill (1995) argues that the likelihood of a successful TQM change effort will increase if it is congruent with the self interest of individual managers. Thus, if managers / supervisors perceive that they will benefit from the intervention, they will be more likely to change their behaviour.

Supervisors' perception of the behaviour of their immediate superior. This category contains three predictors. The first two relate to the supervisor's perception of their immediate superior's participative style and commitment to quality. These two predictors have been used in earlier models as antecedents of team orientation (participative style) and commitment to improvement (superior commitment to quality). In this model, these perceptions are of a supervisor's superior rather than employees perceptions of their supervisor as used previously. It is hypothesized that a supervisor's perception of the participative style of their immediate superior will have a positive impact on the supervisor's own participative style. Similarly, a supervisor's perception of their immediate superior's commitment to quality is hypothesized to have a positive

effect on the supervisor's own commitment to quality. The rationale for this link is similar to that put forward in chapter 6 where it was hypothesized that a supervisor's commitment to quality would have a positive impact on employee commitment to improvement.

The final predictor in this category is a supervisor's perception of the degree to which his/her immediate superior is reinforcing the intervention. It is hypothesized that the more a supervisor perceives his/her immediate superior as reinforcing the intervention, the more likely it is that the supervisor will be participative in his/her style of managing and committed to quality.

10.4 Measures and analysis procedures

This section presents the new measures applicable solely to individuals in a supervisory position which have not been discussed in previous chapters. In addition, as the predictors outlined in the model come from two categories and are measured differently, these are briefly discussed. Following from this, the analysis procedures are presented.

Theory Y This four item scale was adapted from a 12 item scale developed by Jacoby and Terborg (1975). The authors found the longer 12 item scale to have a high internal consistency (r=.85) and a test-retest reliability of .68 based on data gathered from supervisors and non supervisors. The four item scale used in this study taps supervisors' agreement or disagreement on general statements about employees; the degree to which individuals are self motivated and controlled; the extent to which employee potential is greater than typically recognized by organizations; the degree to

which the average person finds work a source of satisfaction and; the extent to which employees are capable of exercising autonomy and independence on the job. The alpha coefficients for this measure using the overall sample of supervisors / managers was .71 at time 1 and .63 at time 2.

Theory X This four item scale was adapted from a 24 item scale developed by Jacoby and Terborg (1975) which exhibited a high internal consistency of .77 and a test-retest reliability of .59. The four items used in this study tapped supervisors' agreement or disagreement on the following: the extent to which an average person wishes to avoid responsibility; the degree to which most employees do not possess the potential to be self starters on the job; whether giving greater independence to most employees would be bad for the organization and; whether an increase in pay is enough to overcome people's inherent dislike of work. The alpha coefficients for this scale using the overall sample of supervisors / managers was .69 at time 1 and .74 at time 2.

Behavioural commitment to the intervention This five item measure taps two dimensions of a supervisor's commitment to the TQM intervention. The first dimension relates to their behaviour towards their subordinates in terms of keeping them well informed and involving them in the intervention. The second dimension taps respondents' perceptions of the degree to which they are practising the principles of the intervention, the extent to which they perceive the intervention as an important part of their job and whether they think that their colleagues would say that the respondent himself/herself is committed to the intervention. This scale exhibited a high level of reliability of .86 at time 2.

In addition to the new measures discussed above, the hypothesized model contains a number of measures that have been discussed in previous chapters. For example,

perceived benefit of the intervention was discussed in chapter 5. In examining the antecedents of team orientation (chapter 4), the participative style of the immediate supervisor was presented. Perceived superior commitment to quality was discussed in chapter 6.

The first stage in the analysis procedures involved the matching of subordinates to their immediate supervisor. This was necessary to create the two dependent variables: supervisory participative style and commitment to quality. These two variables represent the mean subordinate group response on two dimensions of their immediate supervisor's behaviour: participative style and commitment to quality. The advantage of using the subordinate group mean response is twofold: first, it represents a more objective measure than asking supervisors how participative they are in their style of managing or how committed to quality they are. Second, as shown in the previous chapters, it is employees' perception of the behaviour of their immediate boss that is important in affecting employee attitudes and behaviour. The argument here is that employee perceptions more accurately represent their reality. After all, an employee can only react to what he/she perceives.

In investigating superior-subordinate relationships, there are a variety of levels of analysis that may be adopted (see Yammarino and Dubinsky, 1992 for a review). Some researchers assert that superior-subordinate relationships are on a one-to-one basis where the superior displays a different style toward individual subordinates within the work group (Dansereau, Graen and Haga, 1975). Thus, a superior may act participatively toward one subordinate and behave more autocratically toward another. An opposing view is asserted by other researchers (Schriesheim and Kerr, 1977) which assume that a superior has a similar relationship with the subordinates in the work group. The key debate rests on whether one assumes heterogeneity or homogeneity of

leader behaviours. Cummings (1975) argues that leaders do not behave differently toward subordinates for two reasons: *" (a) equality considerations aimed at countering accusations of preferential treatment, and (b) time and energy costs associated with the diagnosis necessary to behave heterogeneously"* (p 184).

Schriesheim (1979) found a very strong relationship between how individuals perceived the behaviour of the leader toward the work group and how they perceived the behaviour of the leader toward them as individuals. He argues *"that although leaders act somewhat differently toward individual subordinates, each leader also has a more general behavioral pattern that subordinates recognize and respond to"* (p346). This view is closely aligned to the one adopted here. The mean response of employee perceptions of their supervisor's behaviour assumes that there is a basic degree of consensus in how the group perceives the behaviour of their supervisor. Thus, a supervisor may adopt a general participative style and within this behave more or less participatively toward individual subordinates.

The analysis was restricted to first line supervisors; that is, the immediate level above employees. Consequently, the sample size is quite small (n=27). However, many of the previous studies investigating issues of supervisory / managerial behaviour have utilized similar sample sizes (see for example, Baum, Sorensen and Place, 1970; Decker, 1982; Fiedler and Mahar, 1979; Hand and Slocum, 1972).

As the sample size is quite small the number of predictors in the model was kept to a minimum. Consequently the only control variable included is the mean response of the subordinate group as to the degree to which they perceive their supervisor as reinforcing the intervention.

In terms of the analysis, the mean subordinate group response to supervisory participative style and commitment to quality at time 2 were separately regressed on the other variables in the model using OLS regression.[3] The analysis was conducted on the time 2 cross sectional data controlling for the dependent variable at time 1. Using the change data was not possible for two reasons. First, there was some movement of employees and supervisors between time 1 and time 2 thereby making it difficult to calculate reliable group mean responses across the two occasions of measurement. Second, the group mean response may not pick up changes at the individual level. For example, if a group mean response remains stable over time, this may be due to changes (positive or negative) at the individual level which may counteract each other.

The mean group responses of perceived supervisor participative style ranged from 3.35 to 6.14 and 2.50 to 6.11 for perceived supervisor commitment to quality. The number of employees comprising the groups ranged from 2 to 10 with the majority of groups containing the mean response of 5-6 employees.

[3] Subordinates were matched to their immediate supervisor at time 1 to provide a mean subordinate group response to supervisory participative style and commitment to quality. Between time 1 and time 2, there was some movement of employees and supervisors between different work areas.

10.5 Results

Table 10.3 presents the results of the predictors of supervisor participative style and commitment to quality controlling for the dependent variables at time 1.[4]

Table 10.3: Predictors of supervisor participative style and commitment to quality

Predictors	Supervisor participative style†	Supervisor commitment to quality†
Theory X	-.48***	-.30**
Theory Y	.12	.18
Perceived benefit of the intervention	.19	.26**
Perceived superior reinforcement of the intervention	.31+	.26**
Behavioural commitment to the intervention	-.73***	-.64***
Perceived immediate superior participative style	.07	
Perceived immediate superior commitment to quality		.16
Adjusted R^2	.58	.77
N	27	27

+ = p<.10 ** = p<.05 *** = p<.01

† subordinate group mean response

The results highlight several significant findings. First, the significant predictors of supervisor participative style and commitment to quality are broadly similar with one exception: perceived benefit of the intervention has a significant impact on perceived supervisory commitment to quality but not on perceived supervisor participative style (although the beta coefficient is high). Second, Theory Y was not found to have a significant impact on participative style or commitment to quality. Also, a supervisor's

[4] The regression analysis was also conducted without controlling for the dependent variable (mean subordinate group response on the two dimensions of supervisory behaviour) at time 1. The results yielded the same significant predictors as controlling for the dependent variables at time 1.

perception of their own superior's participative style (or commitment to quality) was not found to significantly affect the supervisor's own participative style (or commitment to quality). Finally, contrary to the hypothesis, supervisory behavioural commitment to the intervention has a significant negative impact on his/her perceived participative style. In other words, the greater their commitment to the intervention, the less they are perceived by their subordinates to be operating along participative lines or to be committed to quality.

10.6 Discussion

In terms of the model, the predictors, with one exception, have an impact in the hypothesized direction although this is not always significant. Overall, the predictors of supervisor participative style and commitment to quality are very similar.

Theory X

The negative significant impact of Theory X assumptions on participative style is entirely consistent with McGregor's (1967) thinking. The result indicates that the more a supervisor accepts Theory X assumptions, the less likely he/she will be perceived by subordinates to behave in a participative manner. This lends support to McGregor's (1967) proposition that managerial assumptions about human nature have a significant impact on the way individual managers interact with their subordinates. As the analysis is cross sectional in nature, what it shows is that participative supervisors tend to accept Theory X assumptions less than non participative or less participative supervisors. However, the results do not show that changes in Theory X assumptions will lead to changes in participative style.

One of the methodological weaknesses of Fiman's (1973) study is the use of subordinate perceptions of his/her supervisor's Theory X and Y assumptions and dimensions of his/her supervisor's behaviour. In using the subordinate as rater of both assumptions and behaviour, this method may be open to bias thus attaining greater consistency between perceptions of assumptions and behaviour. This study overcomes this problem by utilizing supervisors' Theory X and Y assumptions and employee perceptions of supervisory behaviour. Consequently, this is a more direct and stringent test of McGregor's (1960) attitude-behaviour linkage which hypothesizes that the supervisor's attitude (not the employee perception of that attitude) would affect his/her behaviour.

Theory Y

In contrast to the significant negative effect of Theory X on supervisory participative style, Theory Y was found not to have a significant positive impact on participative style. This is contrary to the findings of Fiman (1973) who found a positive relationship between Theory Y assumptions and consideration and Theory Y behaviours. Moreso, the absence of a significant impact in this study goes against the implicit assumption underlying much of the HRM literature which emphasizes a Theory Y view of employees presumably resulting in Theory Y type behaviours. In terms of competing predictors, the results suggest that Theory X is a more significant, albeit negative, predictor of participative style than Theory Y. It is worth considering several possible explanations for this result.

The first possible explanation concerns the measurement of Theory Y assumptions; that is, the selection of the four items from Jacoby and Terborg's original 12 item scale. The argument would be that the four items selected may not be expected to relate directly to participative behaviour; that is, the four items do not specifically tap

participative type assumptions.[5] This explanation is unlikely as the same argument could be levelled against the items measuring Theory X assumptions. The second possible explanation has to do with a more rigorous methodology in terms of using a supervisor's attitude and employee perception of their behaviour. While this seems a plausible rationale, it is unlikely given the significant impact of Theory X.

A third possibility is that beyond a certain point, greater subscription to Theory Y has no further effect on Theory Y type behaviours. While potential explanations have been raised, it is not possible to speculate any further given the paucity of research examining the link between Theory X and Y and behaviours.

Superior reinforcement of the intervention

A supervisor's perception of their immediate superior reinforcing the intervention has a significant effect on the supervisor's commitment to quality and to a lesser degree on participative style. This is consistent with the recommendations from leadership (House, 1968) and human relations (Hand and Slocum, 1970) training. The issue here is the transferability of the training back to the workplace. Hand and Slocum (1970) argue that the superior must act as a reinforcer so that the principles learned on the training program become integrated into the operating procedures of the organization. Hand et al. (1973) in their study of human relations training found no significant change in managerial attitudes and behaviour after 3 months. However, significant change was evidenced after 18 months. The authors suggest that for a training program to take effect, the organization's decisions need to reinforce the attitudes learned on the training program on an ongoing basis. This is consistent with prior research (Fleishman, 1955; House, 1968) which showed the ineffectiveness of training in inducing attitudinal and behavioural change when such changes are not supported in the

[5] For example, the average person prefers to have greater influence in decision making than typically given in organizations or most employees would welcome the opportunity for greater participation

work environment. With particular reference to human relations training, Hand and Slocum (1972) argue *"it is difficult to produce a change in individual behaviour toward being more considerate to the needs of others if the culture is imbedded with other values"* (p 416).

The importance of reinforcement has implications for TQM change efforts. This study has highlighted the importance of one source of reinforcement, namely, the supervisor's superior. Most of the writings on TQM emphasize leadership, education and training as the primary mechanisms to affect change (Deming, 1986; Oakland, 1989). However, Hill (1995) argues that it may be necessary to use additional mechanisms such as reward and punishments in order to reinforce the desired change. In the present organization, management, assumed that TQM training, appropriate resources and arrangements would lead to the desired culture change. By the end of the second round data collection, management realised that additional reinforcements would be necessary to ensure attitudinal and behavioural change. Consequently, while the superior may be an important source of reinforcement, it may not be sufficient on its own.

Perceived benefit of the intervention

Perceived benefit of the intervention has a significant positive impact on supervisory commitment to quality. Thus, the greater the perceived benefit, the more a supervisor is perceived to be committed to quality. This has practical implications for those at the top of the organization in their efforts to elicit quality oriented attitudes and behaviours from supervisors and managers. There is a need to ensure that individual managers are aware and informed of the future benefits to be gained from implementing TQM. The perceived benefits may take the form of greater involvement and influence in decision making both upwards and horizontally or it may take the form of career advancement through gaining attention of senior managers as a result of performing well in terms of

TQM (Hill, 1995). The importance of perceived benefit has already been highlighted in terms of having a significant impact on improvement as part of the job and to a lesser degree on intrinsic motivation at employee level. Thus, perceived benefit has a role to play in affecting change at all levels in the organization.

Behavioural commitment to the intervention

The impact of supervisory commitment to the intervention on the two dependent variables is contrary to the hypothesized relationship. One would have expected greater commitment to the intervention to have a positive impact on perceptions of supervisory behaviour. The result appears to be counter intuitive; the more committed supervisors are to the intervention the less supervisors are perceived to be participative and committed to quality by their subordinates. The initial explanation may be a measurement issue; that is, there is a flaw in the measurement of behavioural commitment to the intervention.

One way to test this is to investigate other attitudes measured at the supervisory level. For example, in predicting employee perceptions of their supervisors' commitment to quality, one could include the supervisor's own reported general orientation to quality as a predictor. One would expect that the stronger a supervisor's (self reported) general orientation to quality, the more his/her subordinates would perceive the supervisor to be committed to quality. If this was found to be the case, it would suggest that there is a flaw in the measurement of supervisor behavioural commitment to the intervention. The results[6] indicate that the stronger a supervisor's general orientation to quality, the less they are perceived by their group of employees to be committed to quality (beta coefficient -.35, $p<.10$). What this result suggests is that the measurement of

[6] This was tested by replacing a supervisor's self reported behavioural commitment to the intervention with their self reported general orientation to quality as a predictor of perceived (employee group mean response) supervisor commitment to quality.

commitment to the intervention is not flawed. Rather, a more likely explanation points to a fundamental difference between a supervisor's perception and evaluation of his/her own behaviour and that of how his/her subordinates perceive and evaluate the behaviour of the supervisor.

This result highlights the problem of using different types of measurement. Rosen (1969) obtained a similar result in linking supervisory attitudes to work group productivity. He found that supervisor's self report characteristics were not related to work group productivity whereas subordinate's perception of the supervisor were related to productivity. Thus, a potential explanation for the result found in this study may be a result of differing perceptions; a supervisor perceives his/her own behaviour differently to how employees see it. This raises a further issue of why this occurs for supervisors' self report measure of commitment to the intervention and not with the other self report supervisory measures used. The distinguishing difference between supervisory commitment to the intervention and the remaining supervisory self report measures is that commitment to the intervention is directly tapping the individual supervisor's behaviour. The remaining measures tap: general views of employees (Theory X and Y), perception of the intervention (perceived benefit) and the supervisor's perception of his/her own superior's behaviour (participative style and commitment to quality)

Pursuing the explanation that supervisors perceive their own behaviour differently (more favourably) to how their subordinates see it, why might this be the case? Why is it that the more supervisors report being committed to the intervention, the less they are perceived to be participative and committed to quality by their group of subordinates? This may be the result of the interaction of two processes. First, subordinates may be inclined to adopt a more critical view of their supervisor's behaviour (especially in the

dimensions that relate to involving subordinates) than the view held by the supervisor. Second, supervisors have a central role to play in the intervention, consequently they may be more likely to inflate their commitment to the intervention as they have more at stake.

Superior behaviour

A supervisor's perception of their superior's behaviour (either in terms of participative style or commitment to quality) does not have a significant impact on the supervisor's own behaviour. This goes contrary to the findings of a previous chapter where employee perception of their supervisor's commitment to quality had a significant impact on the employee's own commitment to quality. Thus, it would seem that the role expectations of a superior is only operative for employees. This is similar to the finding of Scott and Bruce (1994) where role expectations had a significant effect on the behaviour of technicians but not on engineers or scientists. The authors offer a potential explanation in that high education, high independence and status equality of the engineers and scientists with managers reduce their receptivity to leader role expectations. A similar explanation may operate in this study.

However, the explanation may also lie with the use of different forms of measurement. To test out the explanation offered by Scott and Bruce (1994), one would need to use supervisor's self reported behaviour. In this case, it is not the supervisors' self reported participative style and commitment to quality that is used but rather employee perceptions of this behaviour. As already mentioned, employees and their supervisor may have different perceptions of the supervisor's behaviour and this may account for the absence of a significant relationship.

In summary, for organizations implementing TQM, it is important for those in supervisory positions to perceive the intervention in beneficial terms and also to perceive their superior as reinforcing the intervention. These perceptions do have an impact on how supervisors' own behaviour is in turn perceived by their subordinates.

10.7 Conclusions

This chapter set out to examine what change had occurred within the supervisory/managerial group. Subsequent to this, two dimensions of the behaviour of first line supervisors; participative style and commitment to quality, were investigated. These dimensions of behaviour were measured by using the mean subordinate group response. This method could be considered to be more objective than asking supervisors about their own behaviour and in addition, as previous chapters have shown, it is pertinent in that it represents employee reality or perceptions of it.

The results suggest that Theory X is a better predictor of supervisory behaviour than Theory Y. The importance of superior reinforcement of the intervention in affecting supervisory behaviour was highlighted. Supervisors' perception of their superior's behaviour was not found to have any significant effect on the supervisor's own behaviour. Contrary to the hypothesis, a supervisor's self reported commitment to the intervention had a significant negative effect on their behaviour as perceived by their subordinates.

The subsequent chapter integrates the findings of this and previous chapters by making an overall assessment of the intervention. It does so by examining the intervention using five different criteria. The first criterion has been the primary focus of this thesis, namely, the impact of the intervention on key elements of TQM. This is supplemented

with an examination of the impact of the intervention on perceived performance improvement and employee involvement outcomes. In addition, the intervention is evaluated on the extent to which it achieved its goals. Finally, the impact of the intervention is examined from a TQM perspective; how would TQM proponents view the effect of the intervention?

Chapter 11: An Overall Assessment of the TQM Intervention

11.1 Introduction

Three distinct strands of inquiry were pursued in the thesis. The initial focus was on investigating the impact of the TQM intervention on some of the core elements of TQM; team orientation, intrinsic motivation, general orientation to quality and improvement as part of the job. The second strand examined the predictors of employee participation in and assessment of the TQM intervention. These two lines of inquiry focused exclusively on employees. In view of the importance of supervisory behaviour, the final line of investigation concentrated on supervisors / managers. However, one question remains, how does one assess the overall impact of the intervention? This chapter addresses this key question by examining the impact of the intervention using a number of different criteria.

Prior to pursuing the issue of assessment, it is worthwhile considering some of the key findings of this study. This discussion excludes the impact of the intervention on the core elements of TQM which is reviewed later as one of the criteria by which the intervention may be assessed.

Who participates in the TQM intervention? This question was addressed in chapter 8 and involved investigating the predictive power of a priori employee attitudes and perceptions on their subsequent participation in the intervention. The single most important determinant of employee participation in the intervention was the behaviour of the supervisor. In other words the participative style of the supervisor at time 1 (prior to the intervention) was found to be a significant predictor of the extent to which their subordinates participated in the intervention. It would seem that supervisors who

are generally more participatively orientated are more willing to cascade the intervention to employees as it is consistent with their normal style of managing.

Unlike other employees participation or involvement programs where the mechanisms by which employees may volunteer to participate are independent of the supervisor, the cascading of a TQM intervention relies on the behaviour of the supervisor to affect employee participation. This, in theory, overcomes the obstacle confronting QCs by integrating supervisors into the improvement process. In doing so, it is potentially damaging to employee participation if a supervisor's behaviour does not facilitate such participation.

Chapter 9 followed a similar line of inquiry and investigated what factors, if any, predispose employees to assessing the intervention more or less positively. One significant finding to emerge from this chapter was the difference in the predictors of participation in and assessment of the intervention. Thus, while employee behaviour (participation) is dependent upon the behaviour of the supervisor, employee attitudes (toward the intervention) are not only influenced by supervisory behaviour but also by other attitudes held by employees prior to the intervention. In addition the results suggest that employees do carry with them their previous experience of a participative program which influences their assessment of future participative programs.

These results directly challenge the validity of the underlying assumption in TQM that employees will react similarly to TQM. Moreso, it questions the taken for granted view *"that employees will welcome, be committed to, and benefit from... [TQM]"* (Wilkinson and Willmott, 1995, p12).

Chapter 10 concentrated on supervisory behaviour in view of its importance in affecting employee attitudes and behaviour. For the entire group of supervisors / managers, there was a lack of significant positive change in their perceptions of the behaviour (participative style and commitment to quality) of their immediate superior. This suggests that within the managerial hierarchy, the cascading process was uneven; that is, it occurred in some areas but not others. In terms of predicting the behaviour (participative style and commitment to quality) of first line supervisors, perceived benefit of the intervention and superior reinforcement of the intervention were found to have a significant positive effect[1] at the individual level. Consequently, the supervisor's superior is an important source of reinforcement. The significant effect of perceived benefit suggests that organizations need to ensure that individual supervisors are aware and informed of the benefits from implementing TQM.

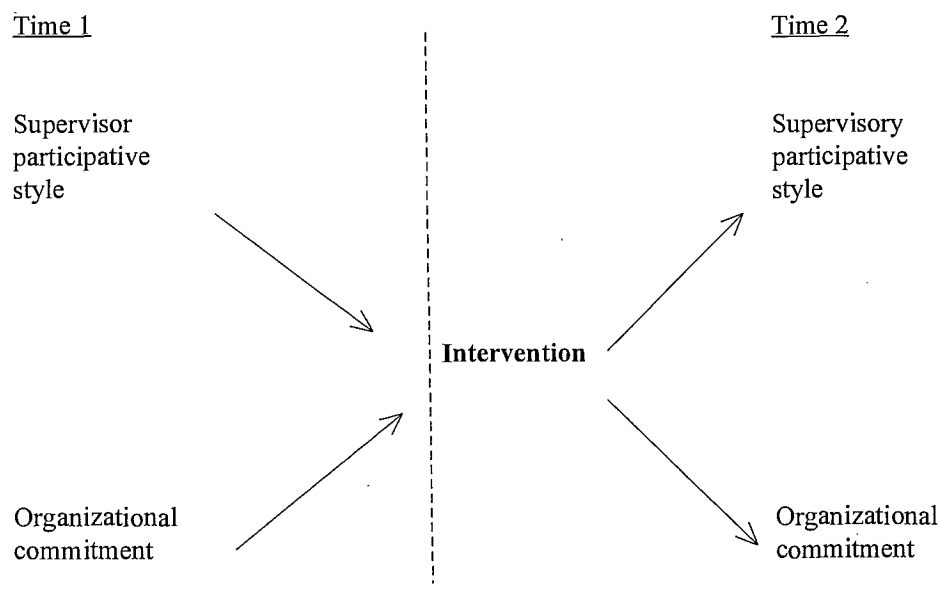
Overall, the findings raise a broad issue that warrants discussion. The issue stems from an assumption made in the earlier chapters that the TQM intervention variables are exogenous in relation to the other variables in the model[2]. Subsequent findings of the predictors of employee participation in and assessment of the intervention question the validity of the assumption made. For example, in the team orientation model, supervisory participative style was treated as an outcome of the intervention. However, in chapter 8 and 9 respectively, supervisor participative style was found to be a significant predictor of different aspects of the intervention; namely, employee participation and perceived appropriateness of the intervention. A similar case is found for organizational commitment. In chapter 7, it was treated as an outcome of the intervention and in chapter 9, it was found to predict how individuals assessed the intervention.

[1] This applies more to supervisory commitment to quality than supervisory participative style.
[2] This assumption applies to chapter 5 and 7.

While longitudinal research facilitates the attribution of cause and effect, these findings highlight the difficulty in dealing with the issue of endogeneity particularly in evaluation studies. An argument was put forward that, for example, organizational commitment affected the assessment of the intervention and was subsequently affected by the intervention. Thus, it was suggested that organizational commitment was both an antecedent and a consequence of the intervention. Similarly, it was also found that supervisor participative style was an antecedent and an outcome[3] of the intervention.

What seems to emerge from this study is that care needs to be exercised in attributing cause and effect. Organizational interventions do not occur in a vacuum, prior experience, attitudes and behaviour of organizational members have an effect on the intervention in question. Figure 11.1 presents the role of organizational commitment and supervisor participative style in the process of change.

Figure 11.1: The role of organizational commitment and supervisor participative style in the process of change



[3] The evidence for treating supervisory participative style as an outcome is not as convincing as for organizational commitment. Nonetheless, for non participants in the intervention, their perception of supervisory participatory style shifted in a positive direction between time 1 and time 2 (significant at 10% level).

To conclude that the process of change is accurately presented to the right of the dotted line in Figure 11.1 does not do justice to the complexity of organizational change. In other words, to argue that the intervention (cause) has an impact on organizational commitment (effect) is not incorrect but only provides one half of the picture. A more accurate representation would take into account (left of the dotted line) the impact of organizational commitment (cause) on the intervention itself (effect). Therefore, it is argued that Figure 11.1 in its entirety is more accurate in reflecting the complexities involved in evaluating organizational change interventions.

Prior to discussing the criteria of assessment, the interpretation of the term impact requires clarification. In particular, the levels at which it is used need to be distinguished. It may be used to describe the effect of the intervention at the individual level and also at the broader organizational or system level to describe the extent of change that has occurred. This difference may be translated into two separate questions. First, has the intervention had an impact on individual attitudes? And second, has there been an overall improvement in the system? For example, the intervention may have a significant effect on team orientation at the individual level but there may not be an overall improvement in team orientation throughout the organization as a whole. What this suggests is that the intervention in principle can have an effect on team orientation and raises the possibility that greater time is needed for the effects at the individual level to develop into an improvement at the system level. Another scenario may be that the intervention has no effect at the individual level but there has been a significant improvement at the system level. This would seem to indicate that the positive change is not linked to the intervention in a direct sense. In other words, this improvement may be an unintended consequence of the intervention or due to other factors not related to the intervention.

Making a distinction between the impact of the intervention at the individual and system level allows for a more finely tuned assessment of the intervention. Table 11.1 presents a summary of the impact of the intervention at the individual level and also indicates whether there has been a significant positive change over time in the overall sample of employees.

Table 11.1 shows that at the individual level, the intervention has a significant total effect on all the variables. Consequently, the intervention can make a difference to individual attitudes. In terms of answering the second question: has the intervention been effective in leading to an overall improvement in the system, the results are not so clear cut. Not all individual level effects have resulted in system improvements. For example, while the intervention has a significant effect (at the individual level) on team orientation and intrinsic motivation, there has not been an overall improvement. On the other hand, the intervention has a significant effect on organizational commitment and perceptions of supervisor participative style (at the individual level) and a significant positive shift has also occurred over time.

Table 11.1: Summary table of the impact of the TQM intervention

	Team orientation	General orientation to quality	Improvement as part of the job	Intrinsic motivation	Performance improvement	Organizational commitment	Supervisor participative style	Supervisory commitment to quality
1. Participation in TQM intervention					✓			
2. Assessment$^{\propto}$ of intervention		✓	✓	✓†		✓	✓	✓
3. Supervisory reinforcement of intervention	✓				✓		✓	✓
4. Significant change between time 1 and time 2~	NO	YES	YES	NO	—	YES	YES	NO

$\propto$ includes perceived benefit and appropriateness of the intervention
† using change data
— only measured at time 2
~ sample of employees

11.2 Criteria of assessment

What criteria should be adopted in assessing the overall impact of the intervention? Would it be sufficient to assess the intervention in terms of its impact on some of the core elements of TQM? Campbell et al. (1970) argue that program effectiveness cannot be appropriately measured in terms of a unitary or global variable. Instead, evaluation studies need to employ multiple criteria. Each criterion has its own strengths and weaknesses. For example, it would seem logical to assess the intervention in terms of its goals; what it set out to accomplish. However, the intervention may not only have multiple goals that are ambiguously stated but also, they may not be shared by those responsible for the intervention. To compound the difficulty in using goals as a criteria of assessment, the goals themselves or the way they are perceived may change during the intervention (Golembiewski, Billingsley and Yeager, 1976).

Given the limitations of relying upon a single criterion to assess the impact of the intervention, a multiple criteria approach is adopted. This type of approach is deemed appropriate in view of the all encompassing nature of TQM. Furthermore, a multiple criteria approach provides a more extensive method of ascertaining the overall impact of the intervention. This is particularly important in view of the lack of evaluation studies investigating the impact of TQM interventions.

Five criteria are used to assess the impact of the intervention. The first criterion involves a re-examination of the intervention in terms of its impact both at an individual and system level on some of the core elements of TQM. The second criterion builds on the previous one by examining the effect of the intervention and the core elements on perceived performance improvement. Subsequently, the impact of the intervention is examined by looking at its effect on employee involvement outcomes.

Consistent with evaluative research, the extent to which the intervention achieved its goals is the basis of the fourth criterion. Finally, the intervention is assessed from a TQM perspective; how would TQM proponents or advocates view the effect of the intervention?

11.2.1 Elements of TQM

The initial criterion selected to assess the intervention is its impact on some of the core elements of TQM. Essentially, this involves a reexamination of the results presented in chapters 5 (team orientation) and 7 (intrinsic motivation, general orientation to quality and improvement as part of the job).

At the individual level, the impact of the intervention on team orientation was indirect; supervisory reinforcement of the intervention had a positive effect on trust in colleagues which in turn had a positive effect on team orientation. Thus, a link was found between the intervention and the outcome of team orientation. Adopting a system view of impact, was there an overall improvement between time 1 and time 2 in team orientation?

In terms of a significant positive improvement in team orientation for the entire group of employees, this has not occurred. In fact team orientation shifted in a negative direction between time 1 and time 2. Thus, although the intervention had a significant effect at the individual level, it was not effective in achieving a positive improvement in the overall group of employees.

However, in view of the short time span of this study, one could plausibly argue that assessing the impact of the intervention in terms of its positive effect on the entire

group of employees (regardless of their participation) is not only unfair but does not reflect the process of change. Particularly in the early stages of the change process (as in this study), there will be individuals who are participating in the intervention and those who are not. Consequently, it may be more logical to examine the impact of the intervention at a subsystem level; that is, the participants in the intervention. Pursuing this line of reasoning, the evidence suggests that for participants (as a group) team orientation has remained unchanged between time 1 and time 2.

In evaluating change interventions, it is worth distinguishing between intended and unintended consequences. The negative shift in team orientation which can be pinpointed to the group of non participants (5.51 at time 1 and 5.28 at time 2) may be considered as an unintended consequence of the intervention. It was previously suggested that this may be a result of non participants feeling excluded from the intervention. This, of course, may be a temporal effect which will disappear once the intervention has diffused throughout the organization.

In contrast to the indirect effect of the intervention on team orientation, the intervention was found to have a significant direct effect on improvement as part of the job (table 7.3). Therefore, at the individual level, it would seem that the intervention can make a difference. With regard to general orientation to quality, the intervention was found to have a significant total effect (the majority of this effect being indirect) at the individual level.

Has there been an overall significant improvement in general orientation to quality and improvement as part of the job? From Table 11.1, the results indicate that there has been a significant positive shift in these two elements. However, this may be largely due to the method by which they were measured at time 1.

At the individual level, the intervention had a significant total impact on intrinsic motivation. However, at the system level, there has not been a significant improvement in intrinsic motivation. Adopting the same logic as outlined for team orientation, it may be more appropriate to examine the impact of the intervention at the subsystem level; participants in the intervention. For participants, intrinsic motivation has remained unchanged between time 1 and time 2 (6.30 at time 1 and 6.36 at time 2). A similar result is found for non participants (6.09 at time 1 and 6.11 at time 2). Therefore, the intervention has not been effective in improving intrinsic motivation for participants. As such, this result is similar to team orientation which remained unchanged for participants between time 1 and time 2.

Using the impact of the intervention on some of the key elements of TQM, what kind of assessment can be drawn from this? It is apparent that different assessments will be contingent upon the level of impact. For example, at the individual level, the intervention has a significant impact on the four elements of TQM. On the other hand, (putting aside the two dimensions of commitment to improvement due to the method by which they were measured at time 1) at a system level, the intervention has not had an impact on any of the elements. Furthermore, taking a subsystem level (participants), the intervention has not significantly improved team orientation or intrinsic motivation. However, in making an assessment, one must consider the time span allowed for the effects of the intervention to occur. Consequently, the counterargument to the assessment at the system level would be that more time is needed for the individual level effects to appear as an overall improvement in the system. However, even in the short term, there is no indication that these individual level effects are beginning to appear as an overall improvement in the subsystem; the group of participants. The issue of time lags for effects to occur in pursued in the concluding chapter.

11.2.2 Performance outcomes

The primary motivator for organizations to adopt and implement TQM is the hypothesized positive impact on organizational performance. While the espoused goal of TQM is often stated as quality, in reality, the real objective is often to increase the efficiency of the organization (Spencer, 1994). This is accomplished by reducing organizational costs in terms of scrap, rework and inspection (Crosby, 1979). This is further exemplified in more recent writings (Gevritz, 1991; Jacob, 1993) which emphasize TQM's ability to induce cost savings, reduce personnel and increase profits. In parallel, TQM has been cited as the mechanism for ensuring organizational effectiveness (survival in the long run) in ever increasing competitive environments (Eisman, 1992; Kiess-Moser, 1990). Grant at al. (1994) view TQM as encompassing the long term interests of employees, shareholders and customers. Improving quality secures the future for the organization and its employees. It may also lead to lower costs and greater customer satisfaction which in turn enhances the competitive position of the organization which benefits its owners and employees. This view of the benefits of TQM is very similar to that espoused by Deming[4] (1986).

In spite of the widely presumed benefits of TQM, there is little (if any) systematic research which investigates the effects of TQM in terms of hard criteria measures of performance (see Mohrman et al. (1995) for the impact of TQM on financial performance criteria). Anecdotal evidence exists of successful TQM companies (see Grant et al., 1994 and; Blackburn and Rosen, 1993) and Hill (1991b, 1995) presents case study evidence of the benefits of TQM. While Hill (1995) acknowledges that the

[4] Deming argues that quality improvement will lead to cost reduction which in addition to improved quality will meet the needs of the customers. This will lead to greater market share which ultimately will lead to lower prices and improved competitiveness.

organizations in his study may be exceptional in terms of their willingness and presumably their capability of committing resources to the implementation of TQM, the other companies heralded as successful examples of TQM have been successful prior to the introduction of TQM. Mohrman et al. (1995) in their survey of 1,000 Fortune organizations investigated the impact of TQM on perceived outcomes; direct performance outcomes of work processes; company profitability and competitiveness and; employee satisfaction and quality of work life. They found a significant correlation between core TQM practices[5] and all three outcomes. For manufacturing organizations, a significant relationship was found between core TQM practices and market share. The authors acknowledge the limitations of their study, in particular its cross sectional nature and its reliance on the perceptions of a single senior person in each organization. Consequently, from the evidence available on the impact of TQM on organizational performance, it is not possible to discern whether TQM leads to improved organizational performance or whether successful companies (to begin with) have the slack resources available to invest and sustain a successful TQM effort.

The lack of empirical research investigating the effects of TQM on hard performance criteria is not only indicative of TQM research to date but applies equally to the broader context of organizational change interventions. Porras and Berg (1978) in their search covering 160 change interventions found only 20 evaluative research studies that examined organizational and work group change in terms of hard criteria. The issue of hard criteria measures has again come to the fore in terms of the impact of Human Resource Management (HRM). Guest (1992b) argues that research efforts to link HRM and organizational outcomes have been hindered by inherent research problems and thus progress has been limited.

[5] These practices include quality improvement teams, quality councils, cross functional planning, process re-engineering, work simplification, customer satisfaction monitoring and direct employee exposure to customers.

The difficulty in linking TQM to organizational performance is further compounded by the fuzziness surrounding what exactly it is and its presumed relationship with HRM. While Guest (1992b) argues that the need for TQM to be integrated with HRM is increasingly being recognized, Blackburn and Rosen (1993) from their research on the Baldrige Award winning companies state that HRM policies *"were mutually interdependent, congruent, and directed at supporting a total quality management perspective throughout the corporation "* (p.50). Putting aside the extraneous factors which may affect performance, should any performance be linked to TQM, is this due to the "hard" aspects of TQM or the "soft" HRM factors or a combination of both?

While some of the problems linking TQM to organizational performance at the organizational level have been outlined, a different set of obstacles confront any attempt to link TQM to conventional measures of work group and individual performance. Factors outside an individual's control must be included as potentially influencing an individual's performance. Waldman (1994) argues that despite the lack of theoretical attention given to opportunity factors, there exists empirical research that highlights the effects of factors outside the individual's control on his/her performance. Consequently, in view of the inherent limitations of hard performance measures[6] and the difficulty in obtaining valid measures, perceptual measures of performance improvement were collected.

Specifically, individuals were asked whether their own performance and that of their work group had improved compared to the year before (prior to the intervention taking place). In addition, they were asked whether improvements had been made in how they

[6] While some hard (e.g scrap, rework) measures were available, they were not comparable across production groups. There was no hard performance measure available that was common to all groups of individuals.

did their job. While this method is far from ideal, it does attempt to go further than linking the intervention to TQM outcomes as discussed in the previous section. However, one could level the criticism of social desirability against this method in that individuals would be more inclined to inflate their performance improvement and that of their work group. As the majority of questionnaires were completed on a one to one basis, efforts were made to reduce an individual's inclination to inflate perceived performance improvement.

Therefore, the next criteria adopted to assess the impact of the intervention looks at the effect of the intervention on (perceived) performance improvement.[7] The measure of performance improvement tapped the extent to which individuals' perceive an improvement in their job performance and that of their work area as well as the degree to which improvements had been made in how they did their job.

Analysis procedures

Up to now, team orientation, intrinsic motivation, general orientation to quality and improvement as part of the job have been treated as key legitimate outcomes of TQM. However, one could argue that these are intermediate outcomes which subsequently affect performance. Therefore, the following analysis addresses two questions. First, is there a link between the intermediate variables (team orientation, intrinsic motivation, general orientation to quality and improvement as part of the job) and perceptions of performance improvement? And second does the TQM intervention have an effect on performance improvement? To do this, performance improvement, the dependent variable, was regressed on the intermediate variables, the intervention

[7] The items measuring performance improvement were factor analysed with the items measuring an improvement in quality climate and commitment to quality. The results presented in appendix 16 indicate the factorial independence of performance improvement from the other two measures.

variables (participation in and assessment of) and the usual set of demographic variables. This analysis was conducted at time 2 on the employee[8] sample at site 1.

Results

Table 11.2 presents the results of the predictors of perceived performance improvement.

Table 11.2: Predictors of perceived performance improvement

Predictor variables	Time 2 Perceived Performance Improvement
Job Tenure	-.04
Age	-.01
Gender	-.08
Length of service	.01
Job Title 2	.13
Job Title 3	.06
Change in supervisor	-.06
Change in job content	.08
Change of jobs	.16**
Team orientation	.12
Intrinsic motivation	-.08
General orientation to quality	.15+
Improvement as part of the job	.00
Participation in the TQM intervention	.19**
Perceived benefit of the intervention	.01
Perceived appropriateness of the intervention	.05
Perceived supervisory reinforcement of the intervention	.26***
Adjusted R^2	.35
N	165

+ = p<.1 ** = p<.05 *** = p<.01

† Measured at time 2

[8] The analysis was restricted to the employee sample so that team orientation and participation in the intervention could be included as predictors of performance improvement. These two predictors (as mentioned in earlier chapters) were not measured at supervisory level.

The results suggest that the impact of the intermediate variables on performance improvement is at best exceedingly weak. In contrast, an individual's participation in the intervention and their perception of supervisory reinforcement of the intervention have a significant effect on perceptions of performance improvement. In other words, an individual's behaviour and that of his/her supervisor significantly affect performance improvement. What is interesting is that individual attitudes toward their work group, job, quality and improvement do not have a significant effect on performance improvement.

These results provide some support for Guest's (1992a) argument (in the context of HRM) for the need to shift the emphasis placed on changing attitudes to include efforts that are targeted at changing behaviour to improve performance. It would seem from the results here that behaviour is a more significant predictor of performance improvement than attitudes. This is interesting in light of the findings of the evaluative element of the thesis whereby participation in the intervention was not a significant predictor of team orientation, intrinsic motivation, general orientation to quality and improvement as part of the job. Rather, individuals' assessment of the intervention was found to be a better predictor of these outcomes. With regard to perceptions of performance improvement, the opposite holds true; participation is a more significant predictor of performance improvement than assessment of the intervention.

Overall, the results highlight the importance of changing behaviour (in this case getting individuals involved in the intervention) as the route to performance improvement. This does not undermine the importance of attitudinal change but in the short term, behavioural change may be more significant. Therefore, the practical implications would be a dual approach to change with education and training serving as the primary mechanisms to attitude change with changes to work design and participation in

continuous improvement as the way to induce behaviour change. Guest et al. (1993) highlight the possibility that an indirect approach to behaviour change (via first changing attitudes) may be less successful than a direct approach to behavioural change. The results here highlight the importance of behaviour over attitudes in affecting perceived performance improvement.

Thus, it would seem that the behavioural components of the intervention (employee participation in and supervisory reinforcement of the intervention) have a significant effect on perceived performance improvement. However, the results and their implications must be interpreted cautiously due to the measurement of performance improvement. What is required is the use of hard criteria of performance in order to test more rigorously the links between behaviour, attitude and performance in the context of TQM.

11.2.3 Other outcomes

The thesis particularly focused on some of the core elements of TQM. Again, in assessing the impact of the intervention, the same elements were the focus of attention. What has been neglected thus far is the impact of the intervention on other outcomes that are not explicitly addressed in the mainstream TQM literature but which are nonetheless important outcomes. These outcomes include organizational commitment and trust in management (used as a rough proxy for employee-management relations).

"Employee involvement is fundamental to TQM ideas" (Wilkinson, 1994, p279). Employee involvement (EI) has been presented as a broad concept (Guest et al., 1993) and includes activities directed at increasing communication to employees and providing them with the opportunity to contribute to decision making in their work

place thereby increasing their commitment to the organization (Marchington et al., 1994). [9] Guest (1992a) categorizes EI initiatives as follows: increased information to employees; increased information from employees; changes to the design of work; changes in incentives and; a more participative style of managing. Far removed from the notion of Industrial Democracy, employee involvement in the context of TQM takes the form of direct involvement in quality and improvement. This may take the form of greater responsibility for quality in their job, contributions to improvements in their work area and may involve a restructuring of work along the lines of semi autonomous work groups.

Previously, the impact of the intervention was assessed in terms of the core elements of TQM. This present assessment takes on board a different position; that is, viewing TQM as representing one form of EI. Consequently, this view focuses on its impact on EI outcomes, namely, organizational commitment and to a lesser extent, trust in management. There is considerable debate and contradictory evidence for the hypothesized EI-organizational commitment link (see Walton, 1985; Ahlbrant et al., 1992 and Grummitt, 1983 for support for the link and Kelly and Kelly, 1991 and; Guest et al., 1993 for contrary evidence). Marchington et al. (1994) provide positive and negative evidence for EI and warn that EI is *" as much affected by the prevailing organizational culture as it is a source of change"* (p890).

In order to assess the impact of the intervention on EI outcomes, a simple analysis (t-tests) is conducted on participants and non participants in the intervention. The key question being addressed is whether employee participation in the intervention has any effect on organizational commitment and trust in management. This analysis was restricted to the employee sample at site 1 and Table 11.3 presents the results.

[9] Marchington et al. (1994) include the following as representing EI: house journals and employee reports, suggestion schemes, team briefings, Quality Circles, works councils and profit sharing.

Table 11.3: Independent t-tests between participants and non participants

	Time 1	Time 2	Change over time
Organizational commitment			
Participants (n=87)	5.40	5.74***	.34***
Non Participants (n=78)	5.25	5.25	.00
Trust in management			
Participants	4.23	4.63**	.39**
Non Participants	4.12	4.24	.11

*** significant differences between the two groups at .01 level
** significant differences between the two groups at .05 level

The results show that participants and non participants were not significantly different prior to the intervention in terms of their commitment to the organization and their trust in management. Significant differences were detected at time 2 and in the change that occurred (T2-T1) between participants and non participants with participants being more committed to the organization and having greater trust in management. In addition, employees were asked a number of questions relating to the impact of the intervention on management-employee relations. Significant differences were found between participants and non participants in their overall mean score of the three items[10] measuring the impact of the intervention on management-employee relations. Participants were significantly more positive (mean score 4.83) than non participants (mean score 3.4) on this dimension.

[10] The particular items were as follows. The intervention has:
improved communications between management and employees
resulted in better relations between management and employees
resulted in greater teamwork between management and employees

The results here would seem to support the EI-organization commitment link. As previously argued, care must be exercised in comparing outcomes of particular EI initiatives given that they can vary dramatically between organizations (Marchington et al., 1994). The organizational context in which they are implemented may also significantly affect the outcomes.

Taking TQM as one form of employee involvement, does it have an impact on generally agreed upon EI outcomes? There is clear evidence that the intervention has a significant effect on organizational commitment at both the individual and system levels. Trust in management has significantly shifted in a positive direction between time 1 and time 2 (results are not shown) for the overall group of employees. It is plausible that the intervention may affect trust in management in a similar manner to that found for management commitment to quality. Overall, the evidence[11] suggests that the TQM intervention has a significant impact on EI outcomes.

11.2.4 Goal achievement

This criterion assesses the intervention in terms of the extent to which the goals of the intervention were achieved. As such it is consistent with evaluative research, *"the determination....of the results....attained by some activity...designed to accomplish some valued goal or objective"* (Suchman, 1967, p31-32). Among other objectives, Brooks (1971) views evaluation as the determination of the extent to which the program achieves its goals. This particular approach to evaluation has its strengths and

[11] While the evidence for organizational commitment is clear cut, it should be noted that the significant differences found in the t-tests (trust in management and an improvement in management-employee relations as a result of the intervention) do not control for the effects of any other variables.

limitations (see Schulberg and Baker, 1971) and rests on two fundamental assumptions (not challenged here) that the goals are known and they can be measured.

Prior to proceeding with assessing the intervention in terms of goal achievement, one issue needs to be addressed. How does this criterion differ from examining the intervention in terms of its impact on the core elements of TQM? As some of the goals of the intervention (team orientation and commitment to improvement) are the same, these are not examined here. Rather the focus here is on the additional explicit goals of the intervention that have not been previously examined.

The explicit remaining goals of the intervention include a change in managerial style, greater employee involvement and an improvement in internal customer-supplier relations. In order to assess the extent to which the intervention achieved these goals, two types of evidence are employed. First, goal achievement is assess by examining the extent of change that has occurred over time. This involves a shift from assessing the impact of the intervention at the individual level to a subsystem level; that is, supervisors as a group and / or employees as a group. Second, a more subjective method of goal achievement is included which consists of management's view of what the intervention has achieved.

The overarching objective of the intervention was to change the culture of the organization to one of participative involvement to achieve continuous improvement and teamwork. Within this broad objective, a primary focus of the intervention was on the style of managing. In particular, the training and education concentrated on Theory X and Y views of employees, notions of empowerment and leadership styles with specific emphasis on participative style.

To assess if there has been a change in managerial style or the thinking behind it, the dimensions used are: Theory X and Y, participative style and supervisory commitment to quality. In terms of supervisory subscription to Theory X (4.02 at time 1 and 3.87 at time 2) there has been a shift in a negative direction although it is not significant. However, there has been a significant positive shift in Theory Y (5.08 at time 1 and 5.39 at time 2). Therefore, it would seem that there has been some shift in managerial thinking. Does this translate into a shift in behaviour? Initially, looking at supervisory perceptions of the behaviour of their immediate superior, perceptions of the participative style of their immediate superior has not significantly changed (4.95 at time 1 and 5.02 at time 2). This lack of significant change is also found in perceptions of commitment to quality (4.87 at time 1 and 5.01 at time 2). A contrasting picture emerges if one looks at employee perceptions. Employee perceptions of supervisory participative style has significantly shifted in a positive direction between time 1 and time 2 (4.98 at time 1 and 5.15 at time 2). In terms of supervisory commitment to quality, there has been a positive shift although not significant. However, employee perceptions of management commitment to quality has significantly shifted in a positive direction (5.10 at time 1 and 5.27 at time 2).

Has the goal of managerial style been achieved? The evidence suggests that there has been a significant change in supervisory subscription to Theory Y as well as employee perceptions of the participative style of their immediate boss. However, in contrast, supervisory perceptions of the behaviour of their immediate superiors (participative style and commitment to quality) has not significantly changed. If we take achievement to mean significant change, then the goal of change in managerial style has been achieved at the employee level but not at the supervisory level despite the significant shift in Theory Y. Relaxing the notion of goal achievement and asking if

progress has been made toward that goal, the evidence does suggest that progress has been made.

Greater employee involvement in the process of continuous improvement was another objective of the intervention. This is a broad and imprecise thus difficult to measure goal. One interpretation of this goal could be the number of employees participating in the intervention. Another view may see greater employee involvement in term of employees having greater influence over decisions in their work and / or work area. In dealing with the first interpretation, 52.7% of employees reported that they were participating in the intervention. What does this mean in relation to the stated goal? Of course, 52.7% of employees participating in the intervention is better than 30% but not as good as 70%. If one takes the goal of 'total employee involvement', then the goal has not been achieved although visible progress toward that goal is evident.

Has there been a reduction between desired and actual influence for the group of employees? The results of paired t-tests indicate that the discrepancy between desired and actual influence has remained stable over time (0.84 at time 1 and 0.83 at time 2) for employees. Thus, at a system level, there has not been a significant change in terms of a reduction in the influence gap between desired and perceived actual influence.

If the goal of employee involvement is viewed as eliciting all employees' participation in the intervention or allowing them greater influence over work related decisions, the goal has not been achieved.

The final objective of the intervention was to improve internal customer-supplier relations; relations between work areas / departments. While this goal was not measured directly, two proxy measures exist; satisfaction with interdepartmental

relations[12] and trust in other departments[13]. An improvement in relations between departments should lead to greater satisfaction with interdepartmental relations and greater trust in other departments. As supervisors / managers are more proximal to other departments than employees, in theory, one should see an improvement initially at this level of the hierarchy. Supervisors do not report greater satisfaction with interdepartmental relations (5.11 at time 1 and 5.28 at time 2) nor is there a significant improvement in trust in other departments (4.53 at time 1 and 4.58 at time 2). A similar picture is provided by employees[14].

This lack of significant positive change in interdepartmental relations is consistent with the state of progress of the intervention. At the time of the second round questionnaire, the issue of customer-supplier relations was just being confronted. This involved an internal customer- supplier audit[15] which it was hoped would provide a mechanism for improving customer-supplier relations. This had commenced at the time of the second round questionnaire.

To conclude, in simple terms, the absolute goals of the intervention have not been achieved. However, one could argue that this is a harsh approach to adopt in view of the short time span allowed for the achievement of goals. Consequently, rather than focusing on the achievement of goals, it may be more realistic to assess the intervention

[12] This was measure with the following items:
Satisfaction with the support of my group gets from other departments
Satisfaction with the opportunities to discuss matter with other departments
Satisfaction with the support my department gives to other departments

[13] This was measured with the following items (strongly agree - strongly disagree)
Other departments can be relied upon to do as they say they will do
Other departments put the overall organization's benefit before their own benefit
Overall, there is a lot cooperation between departments

[14] Satisfaction with interdepartmental relations 4.51 at time 1 and 4.56 at time 2. Trust in other departments 4.47 at time 1 and 4.42 at time 2.

[15] This involves representatives from two work areas/ departments coming together to discuss the outputs of one department for another; what are the important outputs, what can be improved and how will the important outputs be measured (to act as a monitoring device)

in terms of progress toward those goals or an improvement compared to the situation prior to the intervention. Adopting this approach, there is evidence of improvement and progress toward those goals. This view that some progress has been made is consistent with the views of senior level managers at the site on the overall impact of the intervention. While they recognized that some progress has been made, they were disappointed at the speed at which change was happening.

11.2.5 A TQM view

So far, the intervention has been assessed by: its effect on the core elements of TQM; its impact on performance improvement; the degree to which EI outcomes were affected and; the extent to which it achieved its goals. The final criterion (if it may be called this) is to assess the intervention from a TQM perspective; how would TQM proponents assess the impact of the intervention?

Achieving culture change is central to what TQM is about (Wilkinson, 1994; Hill, 1995; Oakland, 1989). From what is known about culture change (Schein, 1985) years rather than months is the appropriate time frame. Blackburn and Rosen (1993) in their study of Baldrige Award winning companies report that *"none of the firms made these changes overnight. Individuals talked in terms of evolution not revolution; years and not weeks of effort"* (p62). This, in conjunction with the long term emphasis underlying TQM would provide TQM proponents with grounds to argue that the benefits would be in the longer term. Hill and Wilkinson (1995) state that a period of up to seven years for TQM to become the way of managing would not be unusual. Whyte and Witcher (1992) argue *"that TQM is after all a radical new approach to business management. The true benefits will be in the longer term "* (p1).

If the benefits materialise in the longer term, what, if anything, does this mean for the change that occurs or needs to occur? Reger et al. (1994) cite a study by Ernst & Young and the American Quality Foundation (1992) which recommended a gradual implementation of TQM to more synoptic efforts. The authors in question argue that TQM programs that are presented as *"radical departures from the organization's past fail because the cognitive structures of members.... constrain their understanding and support of new initiatives"* (p566). Rather the authors argue for a step by step introduction of a moderate degree of change.

The short term nature of this evaluation would be perceived as antithetical to the long term emphasis underlying the TQM philosophy. Consequently, proponents of TQM would argue that the impact of TQM should be evaluated on a longer term basis. However, from a TQM stance, the impact of the intervention may be viewed as a positive start in the implementation of TQM that needs to be reinforced and built upon with other changes.

11.3 Discussion

In examining the impact of the intervention on the core elements of TQM, the results suggest that while the intervention had an impact at the individual level, this did not lead to an overall improvement in the system. Therefore, in principle, the TQM intervention did have an effect but in the short term, the intervention was ineffective in leading to overall improvements. In terms of perceived performance improvement, the intervention was found to have a significant impact at the individual level. In particular, the behavioural components of the intervention; employee participation and supervisory reinforcement were found to be better predictors of perceived performance

improvement than the key elements (in this study) of TQM. This highlights the importance of changing behaviour as a route to performance improvement, at least in the short term.

Assessing the impact of the intervention against its goals, the evidence suggests that the goals have not been achieved although progress has been made. A more favourable assessment emerges if the impact of the intervention is measured against EI outcomes. Finally, an attempt was made to assess the impact of the intervention from a TQM perspective. Having assessed the intervention using five different criteria, what overall conclusion can be drawn?

Overall, there is evidence to suggest that in the short term, the intervention has had a minimal effect in terms of overall significant improvement at the system level. Against this unfavourable assessment is the positive impact of the intervention on EI outcomes. Does this detract from the previous evidence? It would seem that the evidence on the side of the intervention having a minimal impact holds ground despite the positive effect on organizational commitment. Why would this be the case? First, it is possible that the positive effect on EI outcomes is an unintended consequence of the intervention. Second, organizational commitment may be more easily affected compared to outcomes more fundamental to TQM. What this conclusion does is neglect the time span permitted for effects to take place.

Given the short time span allowed for the assessment, what change could one expect as a result of the TQM intervention? There exists little empirical work that focuses on the process of change or rather the implementation of TQM. One key finding of Hill's (1995) research on the implementation of TQM was the time it took to cascade throughout the organization. Even in the organization which had the most explicit view

of TQM and a comparatively more prepared scheme, implementation began with top management and took two years before it reached the lowest level in the hierarchy. A similar picture is painted of the implementation of TQM in the remaining organizations. With this type of time frame as a guideline for the implementation of TQM, one may be inclined to argue that in the initial period, the overall extent of change may not be that significant. However, as a counterargument, one would expect to see significant change in the group of managers / supervisors given that this group would not only have greater but also longer experience with the intervention.

This chapter highlights several issues. Given the relatively early stage in the development (both theoretically and empirically) of TQM, the use of multiple criteria of assessment is necessary in order to fully evaluate the impact of TQM interventions. By doing this, it was shown that while the present intervention had minimal impact on the key elements of TQM, a stronger effect was found for EI outcomes. Second, a distinction needs to be made between impact at the individual level and an overall improvement in the system. With this distinction in mind, the intervention had a significant effect at the individual level on all the elements (in this study) of TQM. However, an overall improvement in the system was not evident. Finally, several questions need to be addressed regarding change. Could there have been greater change? Why was more change not visible? The concluding chapter picks up these questions.

11.4 Conclusions

This chapter set out to make an overall assessment of the impact of the intervention. To do this, the impact of the intervention was assessed using the following criteria: its impact on some of the core elements of TQM; the degree to which the intervention

influenced perceived performance improvement; its effect on employee involvement outcomes; the extent to which the goals of the intervention were achieved and finally; an assessment from a TQM perspective.

Overall, the results indicate that the intervention was not effective in leading to an overall positive change in the key elements of TQM. This may be partly due to the short time allowed for the effects of the intervention to occur. It may also be due to the nature of the intervention. The concluding chapter addresses the following two questions: could there have been greater change? And why wasn't there?

Chapter 12: Conclusions

12.1 Introduction

Adopting a number of different criteria of assessment, the prior chapter assessed the impact of the intervention. The evidence suggests that at the individual level, the intervention was found to have a significant total effect on all the key elements in this study. Of these elements, the intervention was found to have a significant direct effect only on improvement as part of the job. Thus, if one relied exclusively on assessing the impact of the intervention on the basis of its direct effects, one would have concluded that the intervention has a significant impact solely on improvement as part of the job. By including the indirect effects, a different conclusion emerges; that is, the intervention has a significant total effect on all the elements.

The intervention did not lead to an overall significant improvement in the key elements of TQM. This conservative conclusion ignores the significant improvement in the two dimensions of commitment to improvement based on its retrospective measurement at time 1. In assessing the impact of the intervention in terms of goal achievement, the conclusion drawn was that progress had been made toward achieving the goals of the intervention. This, in addition to the significant total effect of the intervention at the individual level and a long term perspective underlying TQM, would suggest that possibly greater time is needed for the positive effects to materialise. Finally, a more positive assessment emerges from assessing the intervention from an Employee Involvement (EI) perspective. This assessment highlights the unintended positive consequences of the intervention.

The conclusion that the intervention had a minimal overall impact raises several issues concerning the content and process of change. First, to what extent are the results found a function of the time span allowed for the effects to occur? In other words, are the results primarily due to the time lag rather than the content and process of change. Putting aside the time lag as a potential explanation of the results, two further questions are raised. First, why did greater change not occur? And could greater change have occurred? These issues have potential implications not only for the content of TQM interventions but also the way they are implemented.

This concluding chapter begins by discussing the key findings of this study and their implications. Then, the questions concerning change are addressed. The penultimate section of this chapter deals with the broad and specific limitations of this research. This provides a basis for outlining directions for future research and areas for subsequent development.

12.2 Main findings

A key finding of this research, at a theoretical level, concerns the conceptual independence of intrinsic motivation and commitment to improvement. Overall, in the TQM literature, several concepts such as commitment to quality, commitment to improvement and intrinsic motivation are widely used but not differentiated. To my knowledge, there has been little attempt to operationalize commitment to improvement. Consequently, a definition of commitment to improvement was put forward in this thesis. Reasonably strong evidence was provided for treating commitment to improvement not as a unidimensional construct but as consisting of two dimensions: general orientation to quality and improvement as part of the job. Furthermore, support

was found for treating the two dimensions of commitment to improvement and intrinsic motivation as independent constructs.

Second, the findings suggest that the intervention affected team orientation, general orientation to quality, improvement as part of the job and intrinsic motivation in a different manner. For example, supervisory reinforcement of the intervention has a significant (total) effect on team orientation. Perceived benefit of the intervention has a significant (total) impact on intrinsic motivation and a significant direct effect on improvement as part of the job. Finally, perceived appropriateness of the intervention has a significant (total) effect on general orientation to quality. This suggests that the intervention has a differential effect on the outcomes in two ways. First, the intervention affects the outcomes differently in terms of direct and indirect effects. Second, different aspects of the intervention affect the outcomes in a different manner.

Therefore, the practical implications seem to be clear cut. It would seem that if 'injob' attitudes (intrinsic motivation and improvement as part of the job) are to be affected, it is important that individuals perceive the intervention as providing benefit to them. On the other hand, if the key target of change is 'outjob' attitudes (team orientation and general orientation to quality); that is, toward the work area and colleagues, the results suggest that aspects other than perceived benefit are important. Organizations implementing TQM will want to change both 'injob' and 'outjob' attitudes. Therefore, the intervention needs to be assessed by organizational members in a favourable light along a range of dimensions. An exclusive emphasis on portraying the intervention as beneficial, if these results are broadly correct, will have no subsequent impact on 'outjob' attitudes. Consequently, organizations need to take steps to increase the likelihood that the intervention is perceived not only as beneficial but also as appropriate and that it is reinforced by the immediate supervisor.

How an individual judges and assesses the intervention is important in affecting subsequent change. This leads to the third main finding of this study concerning the relative effect of employee participation in and assessment of the intervention. Overall, the results suggest that it is the assessment of the intervention that is a better predictor of subsequent changes rather than participation in the intervention *per se,* which was not found to have a significant effect on any of the outcome variables. Therefore, involving employees in the TQM intervention is not a sufficient condition to affect change. What is of greater significance is how employees perceive and assess the intervention.

The lack of predictive power of participation on subsequent attitudes deserve attention given its emphasis in the Quality Circle (QC) and Employee Involvement (EI) literature. Several explanations were put forward for this finding. Participation may not have matched pre participation expectations thus having no effect or a damping effect on subsequent attitudes. Second, much of the literature on TQM, QC and EI programs stresses the voluntary nature of employee participation. However, in practice, little is known about the extent to which individuals are put under pressure from peers and/or their immediate boss to participate. Thus, the extent to which an individual is put under pressure to participate may influence the lack of change in subsequent attitudes.

Therefore, the results highlight the importance of tapping an individual's assessment of the participatory mechanism as an important explanatory factor of the outcomes. From this, it is suggested that the emphasis should move away from a direct participation-outcome linkage to a participation-assessment-outcome linkage. By including

individuals' assessment of what they are participating in may shed light on why (or why not) participation does (or does not) lead to desired outcomes.

More specifically, this finding has policy implications for the implementation of TQM interventions. For affecting change, it is not sufficient to involve employees in the intervention *per se.* What the results suggest is that in the design and the subsequent implementation of TQM interventions, emphasis needs to be placed on how the intervention will be perceived by employees. As discussed in chapter 1, considerable emphasis is placed on 'total participation' in the TQM literature. Following from this, the prescription for organizations would emphasize getting everyone in the organization participating in the intervention. The results here suggest that an equal, if not more important consideration, is how the intervention is judged by organizational members. The latter consideration cannot be subordinate to the first; total participation (if this is realistic) with a less than favourable assessment may not lead to the desired outcomes in terms of attitudinal change.

The fourth finding relates to supervisory behaviour. A consistent finding throughout the results is the importance of supervisory behaviour in affecting employee attitudes and behaviour. Perceived supervisory behaviour was found not only to have an effect on the key elements (in this study) of TQM but also on employee participation in and assessment of the intervention. Where it was tested, the results indicate that the immediate supervisor has significantly greater effect than management as a group on employee attitudes and behaviour.

This finding highlights the importance of the immediate supervisor which seems to be overlooked in the TQM literature. An overwhelming and consistent emphasis is placed on the commitment of senior management to TQM and management commitment to

quality as a vital ingredient for success in TQM efforts. In contrast, far less importance is assigned to leadership down the hierarchy as evidenced by the general absence of discussion on the role of front line supervisors. There are two possible explanations for this lack of emphasis given to supervisors. First, their role may be deemed comparatively unimportant in contrast to senior management. Second, there may be an implicit assumption that the commitment of senior management will cascade smoothly to first level supervisors.

What the findings here suggest is that at the employee level, the important influence comes from the immediate supervisor. This does not negate the importance of senior management commitment but indicates that in itself it does not directly affect employee attitudes and behaviour. The inherent chain of example setting of the level above for the level below can be broken at any stage. Consequently, while senior management may be committed to the philosophy of TQM, this must be cascaded down to the lowest supervisory level so that employees, in turn, are affected. Thus, while commitment from senior management is a necessary condition for the success of TQM, it is not a sufficient condition on its own to instill quality oriented attitudes and behaviour in employees.

Finally, organizational change interventions do not occur in a vacuum; that is, prior experience, attitudes and behaviour of organizational members have an effect on how the intervention is assessed and subsequently how successful the intervention is in terms of changing attitudes and behaviours. For example, an individual's prior commitment to the organization and previous experience of a participative program prior to the intervention influences how they assess the intervention in terms of perceived benefit. This has implications for evaluation studies and for organizations implementing change initiatives such as TQM.

In terms of evaluating organizational change interventions, care needs to be exercised in the attribution of cause and effect. Organizational commitment, for example, has been used as an outcome of employee involvement programs and more broadly of HRM practices and policies. Evaluating the impact of these interventions in terms of the effect on organizational commitment ignores the potential effect of organizational commitment on the change intervention in the initial instance. Therefore, what is presented is an oversimplified picture of the process by which change occurs. The results here suggest that the process of organizational change is more complex; organizational commitment was found to be an antecedent of how individuals assessed the intervention and also an outcome of the intervention. Therefore, to treat organizational commitment solely as an outcome may misrepresent how change occurs in organizations.

The policy implications for organizations implementing TQM interventions are as follows. First, individuals' prior experience of employee involvement activities do influence their future assessment of similar activities. Therefore, if an organization's previous involvement activity was largely unsuccessful and it is embarking upon a TQM intervention it may be necessary from the onset to ensure that the TQM intervention is disassociated and clearly differentiated from the previous activity especially if the time lapse is reasonably short. What may be required pre intervention is the creation of a state of readiness to change, similar to Lewin's (1951) unfreezing so as to increase the likelihood of attitudinal change occurring. As mentioned in chapter 2, given the previous changes (prior to the intervention) at the site which contributed to the site's transformation from a loss making situation to one of profitability, it is quite likely that with the intervention, there was an overall lack of perceived need for change at the site.

Second, an individual's attitude toward the organization prior to the intervention has an effect on how the intervention is assessed. Clearly, this presents a dilemma if attitudes prior to the intervention affect how the intervention is assessed which in turn affects the degree to which attitudinal change occurs. In hindsight, greater attention to creating a stimulus for change may have facilitated greater change.

Finally, as indicated at the beginning of this chapter, the TQM intervention had a minimal overall impact on attitudes. This provides the grounding for the ensuing discussion of why greater change was not evidenced at the site.

12.3 The extent of change

Overall, there was little change evidenced between time 1 and time 2. What, if any, factors may help explain this apparent stability in attitudes and behaviours that were the focus of the training and education. Several possible contributory factors to the lack of change are discussed. The first three factors relate to the intervention: its content, reinforcement and transferability, and the process of change. The final possible factor is the time span allowed for the effects to take place.

In terms of the content of the TQM intervention, the training and education program constituted the foundation of and signified the start of the TQM intervention. It was categorized as a 'soft' intervention due to its emphasis on attitudes, values and indirectly behaviour. Regarding change, two assumptions were in operation. First, change at the level of employees is dependent upon change occurring at the managerial level. Second, the education and training program would affect attitudinal change which in turn would affect behaviour.

The content of the training and education program is consistent with TQM. Due to a lack of available descriptive accounts of other TQM interventions, it is not possible to ascertain how this intervention matched others regarding content. Whether a different training content would have induced greater change is an open question. However, a more damaging factor is the underlying assumption regarding change; that is, that participation in the training program would lead to attitudinal change which subsequently would result in behavioural change.

The primarily indirect approach to changing behaviour via attitudes, as previous research indicates, may not be as successful as directly focusing on behavioural change. Therefore, using a training and education program as the primary driver of change may not produce the desired results. Guest and Peccei (1994) argue that interventions using training as the initial lever of change have a history of failure. Consequently, the lack of change resulting from an intervention relying heavily on education and training is not surprising in light of the previous research findings. Therefore, organizational change interventions may increase their chance of affecting change by adopting a dual focus on both attitudes and behaviour. At this site, as a result of the perceived lack of progress occurring, at the end of this evaluation, targeting behaviour via the performance objectives and appraisal of managers was now the focus of the change efforts. Had this been implemented at the beginning to reinforce the training and education, possibly, greater change may have occurred in the short term.

The second potential contributing factor to the lack of change is a lack of reinforcement of what was learned on the training and education program. As mentioned in chapter 2, considerable preparation was given to the design of the intervention and how the training was to be cascaded down the managerial hierarchy. Therefore, while all

managers and supervisors participated in the training program, when they returned to the 'workplace' and organizational reality, the 'environment' did not support or reinforce the change. In other words, applying the principles of learning in training back in the work environment was problematic.

The issue of reinforcement is vital to increasing the chances of training programs inducing change back in the organization. One potentially powerful source of reinforcement is the behaviour of the immediate superior. This type of reinforcement was not strong within the managerial hierarchy as evidenced by the lack of significant difference in perceptions between supervisors and employees in terms of the extent to which their immediate boss reinforced the intervention. In addition, other mechanisms such as performance appraisal were not in place to stimulate the transferability of the training. Consequently, the lack of reinforcement may have contributed to the ineffectiveness of the training program.

A related factor is the process of change. The onus and responsibility was on the individual supervisors to cascade the training to their employees. If reinforcement of the training was generally weak, as in the case of supervisors, this would have a knock on effect in the cascading of the training to employees. Thus relying on supervisors to cascade the training was detrimental given that the training was not reinforced at the supervisory levels.

To summarize, the heavy reliance on training and education without strong reinforcements back in the organization seem to have reduced the potential effect on, in the first instance, change within the supervisory hierarchy and consequently, change at the bottom of the organization.

The time span allowed for this evaluation study may have had a strong effect on the findings; that is, the general lack of change. One could argue that in this case, given the process by which change was planned (i.e. the cascading process), an adequate time frame was not adopted. Supervisors / managers were returned to face organizational reality and the associated pressures of their job, consequently, immediate action in terms of cascading the intervention may not have been feasible or realistic. Even if the intervention was perceived as a high priority and reinforced through organizational mechanisms, the very nature of cascading a change process takes time.

The potential influence of the time lag on the results has been raised but needs to be pursued further. Specifically, to what extent can the time lag account for the results? Greater reinforcement of the intervention may have speeded up the cascading process. Consequently, while the time lag may be a factor, attention needs to be placed on the process of change. Second, if the time lag was a major factor, one would expect to see a significant change in the attitudes, perceptions and behaviours in the target subsystem (first order change) of supervisors/managers. If this were the case, one would be in a stronger position to argue that a greater time lag is needed for effects to occur. Pursuing this further by looking at second order change; that is, change in the subsystem of employee participants in the intervention, the evidence suggests that minimal change has occurred.

Therefore, while the issue of the time lag may be a factor in explaining the overall lack of significant change, it may not be the most important factor. The argument presented here was that if the issue of time per se was a major factor, one would expect to see significant change in the subsystem proximal to the intervention. In this case, this has not happened, therefore, other factors need to be taken into account to explain the extent of change that occurred.

12.4 Greater change?

Could greater change have occurred? In other words, taking the content of the intervention as given, what other steps could have been taken to increase the likelihood of greater change occurring?

There was a lack of visible planning as to what would happen once all supervisory personnel had completed the training program. Too much attention and energy was invested in the design and cascading of the training within the supervisory ranks at the expense of what was to happen post training. Probably, what was needed at the preparation stage was a systems view of training. Viewing the training as a subsystem within an overall system may have indicated the changes that needed to occur in other systems so that all the subsystems were reinforcing each other. This may have highlighted the need to modify performance objectives and appraisal to reinforce the change and highlight the importance attached to the intervention.

If other organizational mechanisms had been used from the onset to reinforce the content of the intervention, greater change may have occurred. This may have reduced the uneven cascading that occurred and gone some way toward building a momentum for change within the managerial ranks prior to involving the shopfloor in the intervention. In addition greater reinforcement may have reduced the length of time it took to cascade the intervention. Simply, rather than relying primarily on affecting attitudes as a way to change behaviour, a dual focus on attitudes and behaviour may have resulted in greater change.

Finally, as mentioned previously, at the preparation stage, greater attention on creating a stimulus for change may have helped. Considering the previous changes that had

been implemented, what was the perceived motivation to embark upon further changes? The necessity for change may not have been perceived as such by organizational members. Survival was the key stimulus underlying the previous major change in the reorganization of production. This stark impetus was absent in relation to the intervention.

12.5 Limitations of the research

Two limitations have been previously discussed: the lack of a priori control group and the short time span allowed for the change to occur. The early intervention in the change process was necessary in order to establish a post hoc control group. However, this time span is quite common in terms of the initial post intervention measurement.

This study focused on the implementation of a 'soft' TQM intervention and thus the findings are limited to this type of intervention. However, this intervention and its reliance on training and education typifies what is prescribed by the quality advocates. It would have been interesting to include another TQM intervention that differed in terms of its content.

The more specific limitations of this study are as follows. First, the focus was on two of the three elements portrayed as central to TQM. The notion of customer satisfaction was not included in this study. Second, it would have been useful to have collected more detailed qualitative data regarding the process of change. In particular, data on pre intervention expectations may have shed light on the subsequent effects of the intervention. Furthermore, a systematic approach to interviewing the managers / supervisors post intervention may have provided greater insight into the uneven cascading process and their interpretation of what was needed in terms of making the

intervention successful in affecting change at the site. In other words, what were the perceived obstacles to change and where were they?

Another limitation of this study is the use of perceived performance improvement. Ideally, objective performance measures would have been collected independently at time 1 and time 2. This would have allowed a more rigorous test of the links between behaviour, attitudes and performance in the context of TQM. Similarly, the use of a retrospective measure of the two dimensions of commitment to improvement at time 1 is clearly not ideal. Finally, the measure of perceived benefit of the intervention is crude in that it does not tap the source of benefits; that is, what individuals perceive the benefits to be.

12.6 Future research

With a relatively new organizational phenomenon such as TQM and its multifaceted nature, research possibilities abound. Consequently, the potential future directions for research are discussed in the context of this study. First, the methodological issues are discussed followed by future avenues for theoretical development.

The most important and most difficult direction for future investigation is longer term evaluations of TQM interventions. To my knowledge, a systematic long term evaluation of TQM has not yet been conducted. This would provide a more appropriate time span to evaluate the effects of a TQM intervention. In this study, it would be interesting to evaluate the subsequent progress of TQM in light of the changes that were beginning to happen when this evaluation ended. In addition, a longer term evaluation would provide rich detail as to the process of change and provide useful insights into whether short term effects result in more enduring changes.

A second methodological consideration involves the use of a control site that is comparable on all important respects except for the TQM intervention. As previously mentioned, this evaluation was of a 'soft' TQM intervention, consequently, future research may want to consider a comparison of the effects of different types of TQM interventions.

The third methodological issue concerns endogeneity in evaluation of change interventions. Future evaluation research should provide a more comprehensive and detailed assessment of the process of change. This means that due consideration needs to be given to the effect of prior attitudes held by individuals on how they interpret and assess a particular change intervention. Subsequently, the effects of the change intervention may be more accurately reflected.

The first area for subsequent theoretical development is the models containing the antecedents of team orientation and commitment to improvement. The models most likely do not include all the relevant and important antecedents of team orientation and commitment to improvement. For example, it would be better to tap individuals' perceptions directly of the extent to which management exhibited team orientation and reinforced team orientation at lower levels rather than indirectly tapping this via management commitment to quality as was done here. Similarly, in the commitment to improvement model, an important antecedent may be the importance attached to continuous improvement within the work group. Future research should include deeper theoretical development on the antecedents of these important outcomes of TQM.

A related area for subsequent theoretical development is the conceptualization of some of the constructs used here. Future research should explore the dimensionality of the

concepts and develop more comprehensive measurement instruments. Commitment to improvement and intrinsic motivation were found to be independent constructs in this study. However, there was no attempt made to measure commitment to quality and assess its conceptual independence from these two concepts.

The theoretical links between the TQM intervention and the intervening variables warrant future attention. Specifically, what mechanisms explain the effect, for example, of perceived supervisory reinforcement of the intervention on higher order need strength. Similarly, other links between the intervention and the intervening variables warrant explicit theoretical grounding.

Finally, as an organizational change intervention, the underlying theoretical basis of TQM needs to be developed in two related directions. First, there is little theory to explain why some TQM interventions are successful and others not. Therefore, one theoretical line of development would be the identification of factors that distinguish successful and unsuccessful interventions. Second, it is easy to attribute the failure of TQM interventions to faulty implementation rather than challenging the validity of the theoretical basis and assumptions of TQM. Here, empirical research and findings from other disciplines may make a contribution by developing a stronger theoretical basis thereby providing a better guide to the implementation of TQM for practitioners.

APPENDIX 1: Questionnaires

Employee 1st round questionnaire

Supervisor 1st round questionnaire

Employee 2nd round questionnaire

Supervisor 2nd round questionnaire

EMPLOYEE 1ST ROUND QUESTIONNAIRE

The London School of Economics and Political Science

THE INFORMATION CONTAINED IN THIS QUESTIONNAIRE SHALL REMAIN COMPLETELY CONFIDENTIAL. NO ONE WITHIN _____ WILL SEE ANY OF YOUR RESPONSES.

SECTION 1

What is your job title? (Please circle one number)

Module Operator	1	Purchase Progress Controller	5
Module Craftsman	2	Analyst	6
Materials Controller	3	Buyer	7
Engineer	4	Clerical	8
		Other	_____

What department/module are you in? (Please circle one number)

Finance & Planning	1	Alternators	8
Engineering	2	FVE/CSG	9
Quality	3	CA45	10
Market Development	4	Other Starters	11
Customer Interface	5	Process	12
Service	6	Thermostat	13
Inline	7	Supplies	14

Within your Module/Department, what cell or section are you in?

Not appropriate 0 Cell/Section Name/No _____

How long have you been in your present job? _____

What year did you join _____? _____

What year did you join the _____ division of _____? _____

How old are you? _____

Are you male or female? Male 0 Female 1

SECTION 2

REGARDING YOUR PRESENT JOB, HOW SATISFIED ARE YOU WITH THE FOLLOWING:
(Please circle the number that best reflects how you feel)

	Extremely dissatisfied	Very dissatisfied	Moderately dissatisfied	Not sure	Moderately satisfied	Very satisfied	Extremely satisfied
Your physical work conditions	1	2	3	4	5	6	7
The freedom to choose your own method of working	1	2	3	4	5	6	7
Your fellow workers	1	2	3	4	5	6	7
The recognition you get for good work	1	2	3	4	5	6	7
Your immediate boss	1	2	3	4	5	6	7
The amount of responsibility you are given	1	2	3	4	5	6	7
Your rate of pay	1	2	3	4	5	6	7
The degree to which you are fairly paid for what you contribute to the organization	1	2	3	4	5	6	7
Your opportunity to use your abilities	1	2	3	4	5	6	7
Industrial relations between management and workers	1	2	3	4	5	6	7
Your chance of promotion	1	2	3	4	5	6	7
The way your firm is managed	1	2	3	4	5	6	7
The attention paid to suggestions you make	1	2	3	4	5	6	7
Your hours of work	1	2	3	4	5	6	7
The amount of variety in your job	1	2	3	4	5	6	7
Your job security	1	2	3	4	5	6	7
The amount of influence you have over day to day work decisions that affect you	1	2	3	4	5	6	7

SECTION 3

PLEASE CIRCLE THE NUMBER THAT BEST SHOW HOW YOU FEEL

Regarding the_____ site:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I am quite proud to be able to tell people I work for _____	1	2	3	4	5	6	7
I feel myself to be part of _____	1	2	3	4	5	6	7
In my work I like to feel I am making some effort, not just for myself but for _____ as well	1	2	3	4	5	6	7
To know my own work had made a contribution to the good of _____ would please me	1	2	3	4	5	6	7
Even if _____ were not doing too well financially, I would be reluctant to change to another employer	1	2	3	4	5	6	7
The offer of a bit more money with another employer would not seriously make me think of changing my job	1	2	3	4	5	6	7

SECTION 4

REGARDING YOUR WORK, HOW IMPORTANT DO YOU THINK THE FOLLOWING ARE:

(Please circle the most appropriate number)

	Not at all important	Not particularly important	Not sure about its importance	Moderately important	Fairly important	Very important	Extremely important
Using your skills to the maximum	1	2	3	4	5	6	7
Achieving something you personally value	1	2	3	4	5	6	7
The opportunity to make your own decisions	1	2	3	4	5	6	7
Challenging work	1	2	3	4	5	6	7
Extending your range of abilities	1	2	3	4	5	6	7

SECTION 5

PLEASE CIRCLE THE NUMBER THAT BEST SHOWS HOW YOU THINK

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
If I got into difficulties at work I know my workmates would try and help out	1	2	3	4	5	6	7
I can trust the people I work with to lend me a hand if I need it	1	2	3	4	5	6	7
I have full confidence in the skills of my workmates	1	2	3	4	5	6	7
Most of my workmates can be relied upon to do as they say they will do	1	2	3	4	5	6	7
I can rely on other workers not to make my job more difficult by careless work	1	2	3	4	5	6	7
Most of my fellow workers would get on with the job even if supervisors are not around	1	2	3	4	5	6	7
My workmates are genuinely committed to improving quality	1	2	3	4	5	6	7
My workmates have specific ideas about how to improve the quality of their work	1	2	3	4	5	6	7

SECTION 6

REGARDING THE FOLLOWING STATEMENTS, PLEASE CIRCLE THE NUMBER THAT BESTS SHOWS HOW YOU FEEL

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I feel a sense of personal satisfaction when I do this job well	1	2	3	4	5	6	7
My opinion of myself goes down when I do this job badly	1	2	3	4	5	6	7
I take pride in doing my job as well I can	1	2	3	4	5	6	7
I feel unhappy when my work is not up to my usual standard	1	2	3	4	5	6	7
I like to look back on the day's work with a sense of a job well done	1	2	3	4	5	6	7
I try to think of ways of doing my job effectively	1	2	3	4	5	6	7

SECTION 7

PLEASE INDICATE WHAT YOU THINK ABOUT THE FOLLOWING STATEMENTS BY CIRCLING THE MOST APPROPRIATE NUMBER

Regarding management at this site:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not Sure	Agree just a little	Agree quite a lot	Strongly agree
Management is sincere in its attempts to meet the workers' point of view	1	2	3	4	5	6	7
I feel confident that _____ will always try to treat me fairly	1	2	3	4	5	6	7
Management would be quite prepared to gain advantage by deceiving the workers	1	2	3	4	5	6	7
Management at work seems to do an efficient job	1	2	3	4	5	6	7
Management can be trusted to make sensible decisions for the firm's future	1	2	3	4	5	6	7
Our division has a poor future unless it can attract better managers	1	2	3	4	5	6	7
Management is genuinely committed to improving quality	1	2	3	4	5	6	7
Management sets examples of quality performance in their daily activities	1	2	3	4	5	6	7
Management does its best to provide employees with the right tools and materials to do a quality job	1	2	3	4	5	6	7
Management has attempted to involve everyone in continuous improvement	1	2	3	4	5	6	7
Management provides support for quality improvements throughout the organization	1	2	3	4	5	6	7

SECTION 8 (Please circle the most appropriate number)

Overall, how satisfied are you with:

	Very dissatisfied	Dissatisfied	Rather Dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Satisfied	Very satisfied
_____, as an employer	1	2	3	4	5	6	7
Quality of supervision	1	2	3	4	5	6	7
Your present job	1	2	3	4	5	6	7
The amount of training on quality you have received	1	2	3	4	5	6	7
The content of your training on quality	1	2	3	4	5	6	7
The support my group gets from other departments	1	2	3	4	5	6	7
The opportunities to discuss matters with other departments	1	2	3	4	5	6	7
The support my department gives to other departments	1	2	3	4	5	6	7

SECTION 9

Please describe the person you usually report to by circling the number that best reflects what you think:

The person I normally report to:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Is genuinely committed to improving quality	1	2	3	4	5	6	7
Encourages me to suggest improvements in the organization of my work	1	2	3	4	5	6	7
Gives me feedback on my suggestions for improvement	1	2	3	4	5	6	7
Gives me more recognition when I produce high quality work	1	2	3	4	5	6	7
Influences how I feel about quality	1	2	3	4	5	6	7
Gives priority to finishing work on time rather than the quality of work	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Sets example of quality performance in his/her day to day activities	1	2	3	4	5	6	7
Demands that people give their best effort	1	2	3	4	5	6	7
Insists that subordinates work hard	1	2	3	4	5	6	7
Gives me enough information to enable me to do a quality job	1	2	3	4	5	6	7
Demands that subordinates do high quality work	1	2	3	4	5	6	7
Is successful in getting people to work together	1	2	3	4	5	6	7
Supports me in getting my job done	1	2	3	4	5	6	7
Can be relied upon to do what he/she says he/she will do	1	2	3	4	5	6	7
Often lets me know how well I am performing my job	1	2	3	4	5	6	7
Encourages people to participate in important decisions	1	2	3	4	5	6	7
Encourages people to speak up when they disagree with a decision	1	2	3	4	5	6	7
Allows people to use their own judgment in solving problems	1	2	3	4	5	6	7
Is making full use of my work knowledge and capabilities	1	2	3	4	5	6	7
Helps subordinates with their personal problems	1	2	3	4	5	6	7
Is concerned about me as a person	1	2	3	4	5	6	7
Feels that each subordinate is important as an individual	1	2	3	4	5	6	7

SECTION 10

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
The quality of my work is important to the success of the organization	1	2	3	4	5	6	7
There are strong incentives for me to improve the quality of my work	1	2	3	4	5	6	7
I have specific ideas about how to improve the quality of work in my group	1	2	3	4	5	6	7
The quality of my work affects the work of other people in _____	1	2	3	4	5	6	7
If I exerted more effort I could improve the quality of my work	1	2	3	4	5	6	7

SECTION 11

(Please circle the number that best reflects what you think)

How much influence do you have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

How much influence would you like to have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

SECTION 12

(Please circle the number that best reflects what you think)

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
This division of _____ is committed to quality	1	2	3	4	5	6	7
Other departments can be relied upon to do as they say they will do	1	2	3	4	5	6	7
Other departments put the overall organization's benefit before their own benefit	1	2	3	4	5	6	7
Overall, there is a lot of cooperation between departments	1	2	3	4	5	6	7
Continuous improvement is essential for the future success of this site	1	2	3	4	5	6	7
I feel I am really part of my workgroup	1	2	3	4	5	6	7
The people in my workgroup encourage each other to work as a team	1	2	3	4	5	6	7
There are feelings among members of my workgroup which tend to pull the group apart	1	2	3	4	5	6	7

Do you think that further quality training would help you in your work?

Yes 1
No 0
Not sure 9

SECTION 13

Are you presently a member of an operational Continuous Improvement Group within this site? Yes 1 No 0

IF YOUR ANSWER IS YES PLEASE GO TO PART A

Have you ever participated in a Continuous Improvement Group within this site? Yes 1 No 0

Would you like the opportunity to participate in a Continuous Improvement Group within this site?

Yes 1 No 0

IF YOUR ANSWER IS YES PLEASE GO TO PART B

IF YOU ARE NOT ANSWERING PARTS A OR B, PLEASE GO TO THE END

PART A

Is it helping you in any way in your work?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

In general, how satisfied are you with the support your group gets for improvements?

Very satisfied	5
Satisfied	4
Neither satisfied nor dissatisfied	3
Dissatisfied	2
Very dissatisfied	1

Do you think training would help your group make improvements?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

In general, how satisfied are you with the recognition your group gets for improvements

Very satisfied	5
Satisfied	4
Neither satisfied nor dissatisfied	3
Dissatisfied	2
Very dissatisfied	1

To what extent does participation in Continuous Improvement Group make use of your abilities and work knowledge?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

PART B

Do you think it would help you in any way in your work?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

To what extent do you think participation in a Continuous Improvement Group would make use of your abilities and work knowledge?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

Do you think participation in a Continuous Improvement Group would help make improvements in your work area?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

Thank you very much for your cooperation

SUPERVISOR 1ST ROUND QUESTIONNAIRE

The London School of Economics and Political Science

THE INFORMATION CONTAINED IN THIS QUESTIONNAIRE SHALL REMAIN COMPLETELY CONFIDENTIAL. NO ONE WITHIN _____ WILL SEE ANY OF YOUR RESPONSES.

SECTION 1

What is your job title? (Please circle one number)

Module Leader	20	Cell Leader	23
Supervisor	21	Manager	24
Section Leader	22	Other _____	

What department/module are you in? (Please circle one number)

Finance & Planning	1	Alternators	8
Engineering	2	FVE/CSG	9
Quality	3	CA45	10
Market Development	4	Other Starters	11
Customer Interface	5	Process	12
Service	6	Thermostat	13
Inline	7	Supplies	14

Within your Module/Department, what cell or section are you in?

Not appropriate 0 Cell/Section Name/No _____

How long have you been in your present job? _____

What year did you join _____? _____

What year did you join the _____ division of _____? _____

How old are you? _____

Are you male or female? Male 0 Female 1

SECTION 2

REGARDING YOUR PRESENT JOB, HOW SATISFIED ARE YOU WITH THE FOLLOWING:
(Please circle the number that best reflects how you feel)

	Extremely dissatisfied	Very dissatisfied	Moderately dissatisfied	Not sure	Moderately satisfied	Very satisfied	Extremely satisfied
Your physical work conditions	1	2	3	4	5	6	7
The freedom to choose your own method of working	1	2	3	4	5	6	7
Your fellow workers	1	2	3	4	5	6	7
The recognition you get for good work	1	2	3	4	5	6	7
Your immediate boss	1	2	3	4	5	6	7
The amount of responsibility you are given	1	2	3	4	5	6	7
Your rate of pay	1	2	3	4	5	6	7
The degree to which you are fairly paid for what you contribute to the organization	1	2	3	4	5	6	7
Your opportunity to use your abilities	1	2	3	4	5	6	7
Industrial relations between management and workers	1	2	3	4	5	6	7
Your chance of promotion	1	2	3	4	5	6	7
The way your firm is managed	1	2	3	4	5	6	7
The attention paid to suggestions you make	1	2	3	4	5	6	7
Your hours of work	1	2	3	4	5	6	7
The amount of variety in your job	1	2	3	4	5	6	7
Your job security	1	2	3	4	5	6	7
The amount of influence you have over day to day work decisions that affect you	1	2	3	4	5	6	7

SECTION 3

PLEASE CIRCLE THE NUMBER THAT BEST SHOWS HOW YOU FEEL

Regarding the_____ site:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I am quite proud to be able to tell people I work for _____	1	2	3	4	5	6	7
I feel myself to be part of _____	1	2	3	4	5	6	7
In my work I like to feel I am making some effort, not just for myself but for _____ as well	1	2	3	4	5	6	7
To know my own work had made a contributiion to the good of _____ would please me	1	2	3	4	5	6	7
Even if _____ were not doing too well financially, I would be reluctant to change to another employer	1	2	3	4	5	6	7
The offer of a bit more money with another employer would not seriously make me think of changing my job	1	2	3	4	5	6	7

SECTION 4

REGARDING YOUR WORK, HOW IMPORTANT DO YOU THINK THE FOLLOWING ARE:

(Please circle the most appropriate number)

	Not at all important	Not particularly important	Not sure about its importance	Moderately important	Fairly important	Very important	Extremely important
Using your skills to the maximum	1	2	3	4	5	6	7
Achieving something you personally value	1	2	3	4	5	6	7
The opportunity to make your own decisions	1	2	3	4	5	6	7
Challenging work	1	2	3	4	5	6	7
Extending your range of abilities	1	2	3	4	5	6	7

SECTION 5

PLEASE CIRCLE THE NUMBER THAT BEST SHOWS HOW YOU THINK

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
If I got into difficulties at work I know my workmates would try and help out	1	2	3	4	5	6	7
I can trust the people I work with to lend me a hand if I need it	1	2	3	4	5	6	7
I have full confidence in the skills of my workmates	1	2	3	4	5	6	7
Most of my workmates can be relied upon to do as they say they will do	1	2	3	4	5	6	7
I can rely on other workers not to make my job more difficult by careless work	1	2	3	4	5	6	7
Most of my fellow workers would get on with the job even if supervisors are not around	1	2	3	4	5	6	7
My workmates are genuinely committed to improving quality	1	2	3	4	5	6	7
My workmates have specific ideas about how to improve the quality of their work	1	2	3	4	5	6	7

SECTION 6

REGARDING THE FOLLOWING STATEMENTS, PLEASE CIRCLE THE NUMBER THAT BESTS SHOWS HOW YOU FEEL

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I feel a sense of personal satisfaction when I do this job well	1	2	3	4	5	6	7
My opinion of myself goes down when I do this job badly	1	2	3	4	5	6	7
I take pride in doing my job as well I can	1	2	3	4	5	6	7
I feel unhappy when my work is not up to my usual standard	1	2	3	4	5	6	7
I like to look back on the day's work with a sense of a job well done	1	2	3	4	5	6	7
I try to think of ways of doing my job effectively	1	2	3	4	5	6	7

SECTION 7

PLEASE INDICATE WHAT YOU THINK ABOUT THE FOLLOWING STATEMENTS BY CIRCLING THE MOST APPROPRIATE NUMBER

Regarding management in this site:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not Sure	Agree just a little	Agree quite a lot	Strongly agree
Management is sincere in its attempts to meet the workers' point of view	1	2	3	4	5	6	7
I feel confident that _____ will always try to treat me fairly	1	2	3	4	5	6	7
Management would be quite prepared to gain advantage by deceiving the workers	1	2	3	4	5	6	7
Management at work seems to do an efficient job	1	2	3	4	5	6	7
Management can be trusted to make sensible decisions for the firm's future	1	2	3	4	5	6	7
Our division has a poor future unless it can attract better managers	1	2	3	4	5	6	7
Management is genuinely committed to improving quality	1	2	3	4	5	6	7
Management sets examples of quality performance in their daily activities	1	2	3	4	5	6	7
Management does its best to provide employees with the right tools and materials to do a quality job	1	2	3	4	5	6	7
Management has attempted to involve everyone in continuous improvement	1	2	3	4	5	6	7
Management provides support for quality improvements throughout the organization	1	2	3	4	5	6	7

SECTION 8 (Please circle the most appropriate number)

Overall, how satisfied are you with:

	Very dissatisfied	Dissatisfied	Rather Dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Satisfied	Very satisfied
_____, as an employer	1	2	3	4	5	6	7
Quality of supervision	1	2	3	4	5	6	7
Your present job	1	2	3	4	5	6	7
The amount of training on quality you have received	1	2	3	4	5	6	7
The content of your training on quality	1	2	3	4	5	6	7
The support my group gets from other departments	1	2	3	4	5	6	7
The opportunities to discuss matters with other departments	1	2	3	4	5	6	7
The support my department gives to other departments	1	2	3	4	5	6	7

SECTION 9

Please describe the person you usually report to by circling the number that best reflects what you think:

The person I normally report to:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Is genuinely committed to improving quality	1	2	3	4	5	6	7
Encourages me to suggest improvements in the organization of my work	1	2	3	4	5	6	7
Gives me feedback on my suggestions for improvement	1	2	3	4	5	6	7
Gives me more recognition when I produce high quality work	1	2	3	4	5	6	7
Influences how I feel about quality	1	2	3	4	5	6	7
Gives priority to finishing work on time rather than the quality of work	1	2	3	4	5	6	7
Sets example of quality performance in his/her day to day activities	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Demands that people give their best effort	1	2	3	4	5	6	7
Insists that subordinates work hard	1	2	3	4	5	6	7
Gives me enough information to enable me to do a quality job	1	2	3	4	5	6	7
Demands that subordinates do high quality work	1	2	3	4	5	6	7
Is successful in getting people to work together	1	2	3	4	5	6	7
Supports me in getting my job done	1	2	3	4	5	6	7
Can be relied upon to do what he/she says he/she will do	1	2	3	4	5	6	7
Often lets me know how well I am performing my job	1	2	3	4	5	6	7
Encourages people to participate in important decisions	1	2	3	4	5	6	7
Encourages people to speak up when they disagree with a decision	1	2	3	4	5	6	7
Allows people to use their own judgment in solving problems	1	2	3	4	5	6	7
Is making full use of my work knowledge and capabilities	1	2	3	4	5	6	7
Helps subordinates with their personal problems	1	2	3	4	5	6	7
Is concerned about me as a person	1	2	3	4	5	6	7
Feels that each subordinate is important as an individual	1	2	3	4	5	6	7

SECTION 10

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
The quality of my work is important to the success of the organization	1	2	3	4	5	6	7
There are strong incentives for me to improve the quality of my work	1	2	3	4	5	6	7
I have specific ideas about how to improve the quality of work in my group	1	2	3	4	5	6	7
The quality of my work affects the work of other people in _____	1	2	3	4	5	6	7
If I exerted more effort I could improve the quality of my work	1	2	3	4	5	6	7

SECTION 11

(Please circle the number that best reflects what you think)

How much influence do you have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

How much influence would you like to have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

SECTION 12

(Please circle the number that best reflects what you think)

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
This division of _____ is committed to quality	1	2	3	4	5	6	7
Other departments can be relied upon to do as they say they will do	1	2	3	4	5	6	7
Other departments put the overall organization's benefit before their own benefit	1	2	3	4	5	6	7
Overall, there is a lot of cooperation between departments	1	2	3	4	5	6	7
Continuous improvement is essential for the future success of this site	1	2	3	4	5	6	7
Most of my colleagues make continuous improvement a top priority in their work	1	2	3	4	5	6	7
My colleagues are receptive to improvement ideas from other work areas	1	2	3	4	5	6	7

Do you think that further quality training would help you in your work?

Yes	1
No	0
Not sure	9

SECTION 13

Are you presently a member of an operational Continuous Improvement Group within this division (comprising people from different sections who are not part of your normal work group?)

Yes 1 No 0

IF YOUR ANSWER IS YES PLEASE GO TO PART A

Would you like the opportunity to participate in a Continuous Improvement Group within this division (comprising people from different sections who would not be part of your normal work group?

Yes 1 No 0

IF YOUR ANSWER IS YES PLEASE GO TO PART B

IF YOUR ANSWER IS 'NO' TO THE TWO QUESTIONS PLEASE GO TO SECTION 14

PART A

Is it helping you in any way in your work?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

In general, how satisfied are you with the support your group gets for improvements?

Very satisfied	5
Satisfied	4
Neither satisfied nor dissatisfied	3
Dissatisfied	2
Very dissatisfied	1

Do you think training would help your group make improvements?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

How satisfied are you with the quality improvements being implemented?

Very satisfied	5
Satisfied	4
Neither satisfied nor dissatisfied	3
Dissatisfied	2
Very dissatisfied	1

PART B

Do you think if would help you in any way in your work?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

To what extent do you think participation in a Continuous Improvement Group with people from different sections contribute to quality improvements?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

SECTION 14

The following answers are general statements, they do not contain right or wrong answers. They are different points of view.

Please indicate what you think about the following statements:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
The best way for a boss to get things done is to use personal authority to direct people	1	2	3	4	5	6	7
The average person prefers to be directed	1	2	3	4	5	6	7
Most employees in any organizations do not possess the potential to be "self starters" on the job	1	2	3	4	5	6	7
The average person wishes to avoid responsibility	1	2	3	4	5	6	7
Giving greater independence to most employees would be bad or the organization	1	2	3	4	5	6	7
Enven increased pay is usually not enough to overcome people's inherent dislike of work	1	2	3	4	5	6	7
People are primarily self motivated and self controlled	1	2	3	4	5	6	7
The average person can find work a source of satisfaction	1	2	3	4	5	6	7
Most employees are capable of exercising a certain amount of autonomy and independence on the job	1	2	3	4	5	6	7
The potential of the average person is much greater than typically recognised by organizations today	1	2	3	4	5	6	7

Thank you very much for your cooperation

EMPLOYEE 2ND ROUND QUESTIONNAIRE

The London School of Economics and Political Science

THE INFORMATION CONTAINED IN THIS QUESTIONNAIRE SHALL REMAIN COMPLETELY CONFIDENTIAL. NO ONE WITHIN _____ WILL SEE ANY OF YOUR RESPONSES.

SECTION 1

What is your job title? (Please circle one number)

Module Operator	1	Purchase Progress Controller	5
Module Craftsman	2	Analyst	6
Materials Controller	3	Buyer	7
Engineer	4	Clerical	8
		Other	

What department/module are you in? (Please circle one number)

Finance & Planning	1	Alternators	8
Engineering	2	FVE/CSG	9
Quality	3	CA45	10
Market Development	4	Other Starters	11
Customer Interface	5	Process	12
Service	6	Thermostart	13
Inline	7	Supplies	14

Within your Module/Department area, what cell or section are you in?

Not appropriate 0 Cell/Section Name/No _____

How long have you been in present job? _____

What year did you join _____? _____

What year did you join the _____ division of _____? _____

How old are you? _____

Are you male or female? Male 0 Female 1

SECTION 2

REGARDING YOUR PRESENT JOB, HOW SATISFIED ARE YOU WITH THE FOLLOWING:
(Please circle the number that best reflects how you feel)

	Extremely dissatisfied	Very dissatisfied	Moderately dissatisfied	Not sure	Moderately satisfied	Very satisfied	Extremely satisfied
Your physical work conditions	1	2	3	4	5	6	7
The freedom to choose your own method of working	1	2	3	4	5	6	7
Your fellow workers	1	2	3	4	5	6	7
The recognition you get for good work	1	2	3	4	5	6	7
Your immediate boss	1	2	3	4	5	6	7
The amount of responsibility you are given	1	2	3	4	5	6	7
Your rate of pay	1	2	3	4	5	6	7
The degree to which you are fairly paid for what you contribute to the organization	1	2	3	4	5	6	7
Your opportunity to use your abilities	1	2	3	4	5	6	7
Industrial relations between management and workers in your firm	1	2	3	4	5	6	7
Your chance of promotion	1	2	3	4	5	6	7
The way your firm is managed	1	2	3	4	5	6	7
The attention paid to suggestions you make	1	2	3	4	5	6	7
Your hours of work	1	2	3	4	5	6	7
The amount of variety in your job	1	2	3	4	5	6	7
Your job security	1	2	3	4	5	6	7
The amount of influence you have over day to day work decisions that affect you	1	2	3	4	5	6	7

SECTION 3

PLEASE CIRCLE THE NUMBER THAT BEST SHOW HOW YOU FEEL

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I am quite proud to be able to tell people I work for _____	1	2	3	4	5	6	7
I feel myself to be part of _____	1	2	3	4	5	6	7
In my work I like to feel I am making some effort, not just for myself but for _____ as well	1	2	3	4	5	6	7
To know my own work had made a contribution to the good of _____ would please me	1	2	3	4	5	6	7
Even if _____ were not doing too well financially, I would be reluctant to change to another employer	1	2	3	4	5	6	7
The offer of a bit more money with another employer would not seriously make me think of changing my job	1	2	3	4	5	6	7

SECTION 4

<u>REGARDING YOUR WORK</u>, HOW IMPORTANT DO YOU THINK THE FOLLOWING ARE:
(Please circle the most appropriate number)

	Not at all important	Not particularly important	Not sure about its importance	Moderately important	Fairly important	Very important	Extremely important
Using your skills to the maximum	1	2	3	4	5	6	7
Achieving something you personally value	1	2	3	4	5	6	7
The opportunity to make your own decisions	1	2	3	4	5	6	7
Challenging work	1	2	3	4	5	6	7
Extending your range of abilities	1	2	3	4	5	6	7

SECTION 5

PLEASE CIRCLE THE NUMBER THAT BEST SHOWS HOW YOU THINK

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
If I got into difficulties at work I know my workmates would try and help out	1	2	3	4	5	6	7
I can trust the people I work with to lend me a hand if I need it	1	2	3	4	5	6	7
I have full confidence in the skills of my workmates	1	2	3	4	5	6	7
Most of my workmates can be relied upon to do as they say they will do	1	2	3	4	5	6	7
I can rely on other workers not to make my job more difficult by careless work	1	2	3	4	5	6	7
Most of my fellow workers would get on with the job even if supervisors are not around	1	2	3	4	5	6	7
My workmates are genuinely committed to improving quality	1	2	3	4	5	6	7
My workmates have specific ideas about how to improve the quality of their work	1	2	3	4	5	6	7

SECTION 6

REGARDING THE FOLLOWING STATEMENTS, PLEASE CIRCLE THE NUMBER THAT BESTS SHOWS HOW YOU FEEL

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I feel a sense of personal satisfaction when I do this job well	1	2	3	4	5	6	7
My opinion of myself goes down when I do this job badly	1	2	3	4	5	6	7
I take pride in doing my job as well I can	1	2	3	4	5	6	7
I feel unhappy when my work is not up to my usual standard	1	2	3	4	5	6	7
I like to look back on the day's work with a sense of a job well done	1	2	3	4	5	6	7
I try to think of ways of doing my job effectively	1	2	3	4	5	6	7

SECTION 7

PLEASE INDICATE WHAT YOU THINK ABOUT THE FOLLOWING STATEMENTS BY CIRCLING THE MOST APPROPRIATE NUMBER

Regarding management in this division:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not Sure	Agree just a little	Agree quite a lot	Strongly agree
Management is sincere in its attempts to meet the workers' point of view	1	2	3	4	5	6	7
I feel confident that _____ will always try to treat me fairly	1	2	3	4	5	6	7
Management would be quite prepared to gain advantage by deceiving the workers	1	2	3	4	5	6	7
Management at work seems to do an efficient job	1	2	3	4	5	6	7
Management can be trusted to make sensible decisions for the firm's future	1	2	3	4	5	6	7
Our division has a poor future unless it can attract better managers	1	2	3	4	5	6	7
Management is genuinely committed to improving quality	1	2	3	4	5	6	7
Management sets examples of quality performance in their daily activities	1	2	3	4	5	6	7
Management does its best to provide employees with the right tools and materials to do a quality job	1	2	3	4	5	6	7
Management has attempted to involve everyone in continuous improvement	1	2	3	4	5	6	7
Management provides support for quality improvements throughout the organization	1	2	3	4	5	6	7

SECTION 8 (Please circle the most appropriate number)

Overall, how satisfied are you with:

	Very dissatisfied	Dissatisfied	Rather Dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Satisfied	Very satisfied
_____, as an employer	1	2	3	4	5	6	7
Quality of supervision	1	2	3	4	5	6	7
Your present job	1	2	3	4	5	6	7
The amount of training on quality you have received	1	2	3	4	5	6	7
The content of your training on quality	1	2	3	4	5	6	7
The support my group gets from other departments	1	2	3	4	5	6	7
The opportunities to discuss matters with other departments	1	2	3	4	5	6	7
The support my department gives to other departments	1	2	3	4	5	6	7

SECTION 9

Please describe the person you usually report to by circling the number that best reflects what you think:

The person I normally report to:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Is genuinely committed to improving quality	1	2	3	4	5	6	7
Encourages me to suggest improvements in the organization of my work	1	2	3	4	5	6	7
Gives me feedback on my suggestions for improvement	1	2	3	4	5	6	7
Gives me more recognition when I produce high quality work	1	2	3	4	5	6	7
Influences how I feel about quality	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Gives priority to finishing work on time rather than the quality of work	1	2	3	4	5	6	7
Sets example of quality performance in his/her day to day activities	1	2	3	4	5	6	7
Demands that people give their best effort	1	2	3	4	5	6	7
Insists that subordinates work hard	1	2	3	4	5	6	7
Gives me enough information to enable me to do a quality job	1	2	3	4	5	6	7
Demands that subordinates do high quality work	1	2	3	4	5	6	7
Is successful in getting people to work together	1	2	3	4	5	6	7
Supports me in getting my job done	1	2	3	4	5	6	7
Can be relied upon to do what he/she says he/she will do	1	2	3	4	5	6	7
Often lets me know how well I am performing my job	1	2	3	4	5	6	7
Encourages people to participate in important decisions	1	2	3	4	5	6	7
Encourages people to speak up when they disagree with a decision	1	2	3	4	5	6	7
Allows people to use their own judgment in solving problems	1	2	3	4	5	6	7
Is making full use of my work knowledge and capabilities	1	2	3	4	5	6	7
Helps subordinates with their personal problems	1	2	3	4	5	6	7
Is concerned about me as a person	1	2	3	4	5	6	7
Feels that each subordinate is important as an individual	1	2	3	4	5	6	7

SECTION 10

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
The quality of my work is important to the success of the organization	1	2	3	4	5	6	7
There are strong incentives for me to improve the quality of my work	1	2	3	4	5	6	7
I have specific ideas about how to improve the quality of work in my group	1	2	3	4	5	6	7
The quality of my work affects the work of other people in _____	1	2	3	4	5	6	7
If I exerted more effort I could improve the quality of my work	1	2	3	4	5	6	7

SECTION 11

(Please circle the number that best reflects what you think)

How much influence do you have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

How much influence would you like to have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

SECTION 12

(Please circle the number that best reflects what you think)

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
This division of _____ is committed to quality	1	2	3	4	5	6	7
Other departments can be relied upon to do as they say they will do	1	2	3	4	5	6	7
Other departments put the overall organization's benefit before their own benefit	1	2	3	4	5	6	7
Overall, there is a lot of cooperation between departments	1	2	3	4	5	6	7
Continuous improvement is essential for the future success of this site	1	2	3	4	5	6	7
I feel I am really part of my workgroup	1	2	3	4	5	6	7
The people in my workgroup encourage each other to work as a team	1	2	3	4	5	6	7
There are feelings among members of my workgroup which tend to pull the group apart	1	2	3	4	5	6	7
I am willing to put myself out to help my workgroup	1	2	3	4	5	6	7

Do you think that further quality training would help you in your work?

Yes	1
No	0
Not sure	9

SECTION 13

Please indicate what you think by circling the most appropriate number

COMPARED TO A YEAR AGO

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
My performance on the job has improved	1	2	3	4	5	6	7
Communication between management and employees has improved	1	2	3	4	5	6	7
Top management is more committed to Total Quality	1	2	3	4	5	6	7
Improvements have been made in how I do my job	1	2	3	4	5	6	7
Visible progress has bee made in improving things at this site	1	2	3	4	5	6	7
Top management is more supportive of suggestions to improve the way things are done around here	1	2	3	4	5	6	7
The performance of my work area/department has improved	1	2	3	4	5	6	7
The level of cooperation between management and employees has improved	1	2	3	4	5	6	7
Total Quality is a greater priority at this site	1	2	3	4	5	6	7
People are encourage more to say how they think things could be done better	1	2	3	4	5	6	7
There is greater contact between management and employees	1	2	3	4	5	6	7

SECTION 14

Please circle the number that best reflects what you think.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I would contribute to improving things around here regardless of total Quality	1	2	3	4	5	6	7
The welfare of employees is taken very seriously at this site	1	2	3	4	5	6	7
My knowledge of Total Quality has increased my efforts to find ways of improving things around here	1	2	3	4	5	6	7

SECTION 15

This section asks your view on the following statements at the present time and also what you think your view would have been a year ago.

{Please circle the number that best reflects what you think)

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I often put forward ideas and suggestions without expecting extra reward	1	2	3	4	5	6	7
How would you have answered this question a year ago? I often put forward ideas and suggestions without expecting extra reward	1	2	3	4	5	6	7
In my work area I am always looking for ways to prevent mistakes	1	2	3	4	5	6	7
How would you have answered this question a year ago? In my work area I am always looking for way to prevent mistakes	1	2	3	4	5	6	7
I am not paid to think of ways of improving things around here	1	2	3	4	5	6	7
How would you have answered this question a year ago? I am not paid to think of ways of improving things around here	1	2	3	4	5	6	7
Looking for ways of improving how things are done around here is part of my job	1	2	3	4	5	6	7
How would you have answered this questions a year ago? Looking for ways of improving how things are done around here is part of my job	1	2	3	4	5	6	7
I have put a lot of effort into thinking about how I can improve my work	1	2	3	4	5	6	7
How would you have answered this question a year ago? I have put a lot of effort into thinking about how I can improve my work	1	2	3	4	5	6	7
I am strongly committed to Total Quality	1	2	3	4	5	6	7
How would you have answered this questions a year ago? I am strongly committed to Total Quality	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
To know that I had made a contribution to improving things around here would please me	1	2	3	4	5	6	7

How you have answered this question a year ago?							
To know that I had made a contribution to improving things around here would please me	1	2	3	4	5	6	7

This section asks you how important you think the following features <u>would be</u> in an ideal Total Quality organization and how important they are <u>in practice</u> in this site.

Please rank all features in order of importance from 1 to 5. 1 being the most important, 2 being the second most important....., and 5 being the least important.

	AN IDEAL TOTAL QUALITY ORGANIZATION	**____ SITE**
Cost reduction		
Product quality		
Morale		
Customer satisfaction		
Participation		

SECTION 16

Please circle the number that best reflects what you think.

COMPARED TO A YEAR AGO, In general, people at this site:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Are more willing to put forward ideas and suggestions without expecting extra reward	1	2	3	4	5	6	7
Exert greater effort in looking for way to prevent mistakes	1	2	3	4	5	6	7
Put greater effort into thinking about how they can improve their work	1	2	3	4	5	6	7
Take greater pride in knowing they had made a contribution toward improving things around here	1	2	3	4	5	6	7
Are more quality conscious	1	2	3	4	5	6	7

SECTION 17

(Please circle the appropriate number)

Do you have the same immediate boss as you did when you completed the previous questionnaire? Yes 1 No 0

Has the content of your job changed substantially since you completed the previous questionnaire? Yes 1 No 0

Have you changed jobs since you completed the previous questionnaire? Yes 1 No 0

SECTION 18

Here are some views on Working Together To Win (WTTW).

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
WTTW is a top priority at this site	1	2	3	4	5	6	7
There is a lot of active support for WTTW among managers	1	2	3	4	5	6	7
There is a lot of active support for WTTW among workers in general	1	2	3	4	5	6	7
My immediate boss is strongly committed to WTTW	1	2	3	4	5	6	7
My immediate boss involves me in WTTW	1	2	3	4	5	6	7
My immediate boss has changed his/her behaviour as a result of WTTW	1	2	3	4	5	6	7
Management and employees will benefit equally from WTTW	1	2	3	4	5	6	7
WTTW will benefit me in my job	1	2	3	4	5	6	7
WTTW has improved communications between management and employees	1	2	3	4	5	6	7
WTTW has resulted in better relations between management and employees	1	2	3	4	5	6	7
WTTW has resulted in greater teamwork between management and employees	1	2	3	4	5	6	7
WTTW is an appropriate way to bring about the type of change needed at this site	1	2	3	4	5	6	7
WTTW is no better or wore than previous initiatives	1	2	3	4	5	6	7
WTTW is not part of my job	1	2	3	4	5	6	7
There is no benefit for me in WTTW	1	2	3	4	5	6	7
WTTW is a management initiative to get people to do more work	1	2	3	4	5	6	7

How well informed do you feel about the aims and objectives of Working Together To Win?

Very well informed	5
Fairly well informed	4
Reasonably well informed	3
Not very well informed	2
Not at all informed	1

How well informed do you feel about what is expected of you in Working Together To Win?

Very well informed	5
Fairly well informed	4
Reasonably well informed	3
Not very well informed	2
Not at all informed	1

SECTION 19

(Please circle the most appropriate number)

To what extent are you presently participating in Working Together To Win (WTTW) activities?

To a very great extent	5
To a great extent	4
To some extent	3
Not much	2
Not at all	1

AT THE PRESENT TIME:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I am committed to participating in WTTW activities	1	2	3	4	5	6	7
WTTW allows me to contribute to improvements	1	2	3	4	5	6	7
WTTW has no effect on my job performance	1	2	3	4	5	6	7
WTTW has no effect on the performance of my work area/department	1	2	3	4	5	6	7
WTTW gives me greater influence in what goes on in my work area/department	1	2	3	4	5	6	7

Would you like the opportunity for greater participation in WTTW activities?

Yes 1 No 0

IF YOUR ANSWER IS YES PLEASE ANSWER THE FOLLOWING QUESTIONS. IF YOUR ANSWER IS NO PLEASE GO TO SECTION 20.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
WTTW will improve my job performance	1	2	3	4	5	6	7
WTTW will allow me to contribute to improvements	1	2	3	4	5	6	7
WTTW will improve the performance of my work area/department	1	2	3	4	5	6	7

SECTION 20

This section is about Total Productive Maintenance (TPM). If this does not apply to you (i.e. you work in a non-manufacturing area) please go to THE END.

Have you received training in Total Productive Maintenance (TPM)? Yes 1 No 0

Are you implementing TPM practices in your job? Yes 1 No 0

IF YOU HAVE ANSWERED <u>YES</u> TO THE LAST QUESTION PLEASE ANSWER THE FOLLOWING QUESTIONS.
IF YOUR ANSWER IS <u>NO</u> PLEASE GO TO <u>SECTION 20b</u> ON THE FOLLOWING PAGE.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
TPM gives me greater responsibility in my job	1	2	3	4	5	6	7
TPM gives me greater control over the quality of my work	1	2	3	4	5	6	7
TPM gives me more variety in my job	1	2	3	4	5	6	7
TPM give me greater involvement in my work	1	2	3	4	5	6	7
TPM allows me greater influence in what goes on in my work area	1	2	3	4	5	6	7
My immediate boss in genuinely committed to TPM	1	2	3	4	5	6	7
There is strong management support for TPM	1	2	3	4	5	6	7
TPM has no effect on my job performance	1	2	3	4	5	6	7
TPM benefits me in my work	1	2	3	4	5	6	7

PLEASE GO TO THE END

SECTION 20b

Would you like the opportunity to implement TPM in your job? Yes 1 No 0

IF THE ANSWER IS YES PLEASE ANSWER THE FOLLOWING QUESTIONS:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
TPM will give me greater responsibility in my job	1	2	3	4	5	6	7
TPM will give me greater control over the quality of my work	1	2	3	4	5	6	7
TPM will give me more variety in my job	1	2	3	4	5	6	7
TPM will give me greater involvement in my work	1	2	3	4	5	6	7
TPM will allow me greater influence in what goes on in my work area	1	2	3	4	5	6	7
TPM will have no effect on my job performance	1	2	3	4	5	6	7
TPM will benefit me in my work	1	2	3	4	5	6	7

THANK YOU VERY MUCH FOR YOUR COOPERATION

SUPERVISOR 2ND ROUND QUESTIONNAIRE

The London School of Economics and Political Science

THE INFORMATION CONTAINED IN THIS QUESTIONNAIRE SHALL REMAIN COMPLETELY CONFIDENTIAL. NO ONE WITHIN _____ WILL SEE ANY OF YOUR RESPONSES.

SECTION 1

What is your job title? (Please circle one number)

Module Leader	20	Cell Leader	23
Supervisor	21	Manager	24
Section Leader	22	Other	_____

What department/module are you in?
(Please circle one number)

Finance & Planning	1	Alternators	8
Engineering	2	FVE/CSG	9
Quality	3	CA45	10
Market Development	4	Other Starters	11
Customer Interface	5	Process	12
Service	6	Thermostat	13
Inline	7	Supplies	14

Within your Module/Department area, what cell or section are you in?

Not appropriate 0 Cell/Section Name/No _____

How long have you been in your present job? _____

What year did you join _____? _____

What year did you join the _____ division of _____? _____

How old are you? _____

Are you male or female? Male 0 Female 1

SECTION 2

REGARDING YOUR PRESENT JOB, HOW SATISFIED ARE YOU WITH THE FOLLOWING:
(Please circle the number that best reflects how you feel)

	Extremely dissatisfied	Very dissatisfied	Moderately dissatisfied	Not sure	Moderately satisfied	Very satisfied	Extremely satisfied
Your physical work conditions	1	2	3	4	5	6	7
The freedom to choose your own method of working	1	2	3	4	5	6	7
Your fellow workers	1	2	3	4	5	6	7
The recognition you get for good work	1	2	3	4	5	6	7
Your immediate boss	1	2	3	4	5	6	7
The amount of responsibility you are given	1	2	3	4	5	6	7
Your rate of pay	1	2	3	4	5	6	7
The degree to which you are fairly paid for what you contribute to the organization	1	2	3	4	5	6	7
Your opportunity to use your abilities	1	2	3	4	5	6	7
Industrial relations between management and workers in your firm	1	2	3	4	5	6	7
Your chance of promotion	1	2	3	4	5	6	7
The way your firm is managed	1	2	3	4	5	6	7
The attention paid to suggestions you make	1	2	3	4	5	6	7
Your hours of work	1	2	3	4	5	6	7
The amount of variety in your job	1	2	3	4	5	6	7
Your job security	1	2	3	4	5	6	7
The amount of influence you have over day to day work decisions that affect you	1	2	3	4	5	6	7

SECTION 3

PLEASE CIRCLE THE NUMBER THAT BEST SHOW HOW YOU FEEL
Regarding the_____site:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I am quite proud to be able to tell people I work for _____	1	2	3	4	5	6	7
I feel myself to be part of _____	1	2	3	4	5	6	7
In my work I like to feel I am making some effort, not just for myself but for _____ as well	1	2	3	4	5	6	7
To know my own work had made a contribution to the good of _____ would please me	1	2	3	4	5	6	7
Even if _____ were not doing too well financially, I would be reluctant to change to another employer	1	2	3	4	5	6	7
The offer of a bit more money with another employer would not seriously make me think of changing my job	1	2	3	4	5	6	7

SECTION 4

REGARDING YOUR WORK, HOW IMPORTANT DO YOU THINK THE FOLLOWING ARE:
(Please circle the most appropriate number)

	Not at all important	Not particularly important	Not sure about its importance	Moderately important	Fairly important	Very important	Extremely important
Using your skills to the maximum	1	2	3	4	5	6	7
Achieving something you personally value	1	2	3	4	5	6	7
The opportunity to make your own decisions	1	2	3	4	5	6	7
Challenging work	1	2	3	4	5	6	7
Extending your range of abilities	1	2	3	4	5	6	7

SECTION 5

PLEASE CIRCLE THE NUMBER THAT BEST SHOWS HOW YOU THINK

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
If I got into difficulties at work I know my colleagues would try and help out	1	2	3	4	5	6	7
I can trust the people I work with to lend me a hand if I need it	1	2	3	4	5	6	7
I have full confidence in the skills of my colleagues	1	2	3	4	5	6	7
Most of my colleagues can be relied upon to do as they say they will do	1	2	3	4	5	6	7
I can rely on other colleagues not to make my job more difficult by careless work	1	2	3	4	5	6	7
Most of my fellow colleagues would get on with the job even if supervisors are not around	1	2	3	4	5	6	7
My colleagues are genuinely committed to improving quality	1	2	3	4	5	6	7
My colleagues have specific ideas about how to improve the quality of their work	1	2	3	4	5	6	7

SECTION 6

REGARDING THE FOLLOWING STATEMENTS, PLEASE CIRCLE THE NUMBER THAT BESTS SHOWS HOW YOU FEEL

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
I feel a sense of personal satisfaction when I do this job well	1	2	3	4	5	6	7
My opinion of myself goes down when I do this job badly	1	2	3	4	5	6	7
I take pride in doing my job as well I can	1	2	3	4	5	6	7
I feel unhappy when my work is not up to my usual standard	1	2	3	4	5	6	7
I like to look back on the day's work with a sense of a job well done	1	2	3	4	5	6	7
I try to think of ways of doing my job effectively	1	2	3	4	5	6	7

SECTION 7

PLEASE INDICATE WHAT YOU THINK ABOUT THE FOLLOWING STATEMENTS BY CIRCLING THE MOST APPROPRIATE NUMBER

Regarding management at this site:

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not Sure	Agree just a little	Agree quite a lot	Strongly agree
Management is sincere in its attempts to meet the workers' point of view	1	2	3	4	5	6	7
I feel confident that _____ will always try to treat me fairly	1	2	3	4	5	6	7
Management would be quite prepared to gain advantage by deceiving the workers	1	2	3	4	5	6	7
Management at work seems to do an efficient job	1	2	3	4	5	6	7
Management can be trusted to make sensible decisions for the firm's future	1	2	3	4	5	6	7
Our division has a poor future unless it can attract better managers	1	2	3	4	5	6	7
Management is genuinely committed to improving quality	1	2	3	4	5	6	7
Management sets examples of quality performance in their daily activities	1	2	3	4	5	6	7
Management does its best to provide employees with the right tools and materials to do a quality job	1	2	3	4	5	6	7
Management has attempted to involve everyone in continuous improvement	1	2	3	4	5	6	7
Management provides support for quality improvements throughout the organization	1	2	3	4	5	6	7

SECTION 8 (Please circle the most appropriate number)

Overall, how satisfied are you with:

	Very dissatisfied	Dissatisfied	Rather Dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Satisfied	Very satisfied
_____, as an employer	1	2	3	4	5	6	7
Quality of supervision	1	2	3	4	5	6	7
Your present job	1	2	3	4	5	6	7
The amount of training on quality you have received	1	2	3	4	5	6	7
The content of your training on quality	1	2	3	4	5	6	7
The support my group gets from other departments	1	2	3	4	5	6	7
The opportunities to discuss matters with other departments	1	2	3	4	5	6	7
The support my department gives to other departments	1	2	3	4	5	6	7

SECTION 9

Please describe the person you usually report to by circling the number that best reflects what you think:

The person I normally report to:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Is genuinely committed to improving quality	1	2	3	4	5	6	7
Encourages me to suggest improvements in the organization of my work	1	2	3	4	5	6	7
Gives me feedback on my suggestions for improvement	1	2	3	4	5	6	7
Gives me more recognition when I produce high quality work	1	2	3	4	5	6	7
Influences how I feel about quality	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Gives priority to finishing work on time rather than the quality of work	1	2	3	4	5	6	7
Sets example of quality performance in his/her day to day activities	1	2	3	4	5	6	7
Demands that people give their best effort	1	2	3	4	5	6	7
Insists that subordinates work hard	1	2	3	4	5	6	7
Gives me enough information to enable me to do a quality job	1	2	3	4	5	6	7
Demands subordinates do high quality work	1	2	3	4	5	6	7
Is successful in getting people to work together	1	2	3	4	5	6	7
Supports me in getting my job done	1	2	3	4	5	6	7
Can be relied upon to do what he/she says he/she will do	1	2	3	4	5	6	7
Often lets me know how well I am performing my job	1	2	3	4	5	6	7
Encourages people to participate in important decisions	1	2	3	4	5	6	7
Encourages people to speak up when they disagree with a decision	1	2	3	4	5	6	7
Allows people to use their own judgement in solving problems	1	2	3	4	5	6	7
Is making full use of my work knowledge and capabilities	1	2	3	4	5	6	7
Helps subordinates with their personal problems	1	2	3	4	5	6	7
Is concerned about me as a person	1	2	3	4	5	6	7
Feels that each subordinate is important as an individual	1	2	3	4	5	6	7

SECTION 10

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
The quality of my work is important to the success of the organization	1	2	3	4	5	6	7
There are strong incentives for me to improve the quality of my work	1	2	3	4	5	6	7
I have specific ideas about how to improve the quality of work in my group	1	2	3	4	5	6	7
The quality of my work affects the work of other people in _____	1	2	3	4	5	6	7
If I exerted more effort I could improve the quality of my work	1	2	3	4	5	6	7

SECTION 11

(Please circle the number that best reflects what you think)

How much influence do you have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

How much influence would you like to have over day to day work decisions that affect you?

A great deal	5
Quite a lot	4
Some	3
A little	2
None	1

SECTION 12

(Please circle the number that best reflects what you think)

	Strongly disagree	Disagree quite a lot	Disagree just a little	Not sure	Agree just a little	Agree quite a lot	Strongly agree
This division of _____ is committed to quality	1	2	3	4	5	6	7
Other departments can be relied upon to do as they say they will do	1	2	3	4	5	6	7
Other departments put the overall organization's benefit before their own benefit	1	2	3	4	5	6	7
Overall, there is a lot of cooperation between departments	1	2	3	4	5	6	7
Continuous improvement is essential for the future success of this site	1	2	3	4	5	6	7
Most of my colleagues make continuous improvement a top priority in their work area	1	2	3	4	5	6	7
My colleagues are receptive to improvement ideas from other work areas	1	2	3	4	5	6	7

Do you think that further quality training would help you in your work?

Yes	1
No	0
Not sure	9

SECTION 13

The following answers are general statements, they do not contain right or wrong answers. They are different points of view.

Please indicate what you think about the following statements:

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
The best way for a boss to get things done is to use personal authority to direct people	1	2	3	4	5	6	7
The average person prefers to be directed	1	2	3	4	5	6	7
Most employees in any organizations do not possess the potential to be "self-starters" on the job	1	2	3	4	5	6	7
The average person wishes to avoid responsibility	1	2	3	4	5	6	7
Giving greater independence to most employees would be bad for the organization	1	2	3	4	5	6	7
Even increased pay is usually not enough to overcome people's inherent dislike of work	1	2	3	4	5	6	7
People are primarily self motivated and self controlled	1	2	3	4	5	6	7
The average person can find work a source of satisfaction	1	2	3	4	5	6	7
Most employees are capable of exercising a certain amount of autonomy and independence on the job	1	2	3	4	5	6	7
The potential of the average person is much greater than typically recognized by organizations today	1	2	3	4	5	6	7

SECTION 14

Please indicate what you think by circling the most appropriate number

COMPARED TO A YEAR AGO

	Strongly agree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
My performance on the job has improved	1	2	3	4	5	6	7
Communications between management and employees has improved	1	2	3	4	5	6	7
Top management is more committed to Total Quality	1	2	3	4	5	6	7
Improvements have been made in how I do my job	1	2	3	4	5	6	7
Visible progress has been made in improving things at this site	1	2	3	4	5	6	7
Top management is more supportive of suggestions to improve the way things are done around here	1	2	3	4	5	6	7
The performance of my work area/department has improved	1	2	3	4	5	6	7
The level of cooperation between management and employees has improved	1	2	3	4	5	6	7
Total Quality is a greater priority at this site	1	2	3	4	5	6	7
People are encouraged more to say how they think things could be done better	1	2	3	4	5	6	7
There is greater contact between management and employees	1	2	3	4	5	6	7

SECTION 15

Please circle the number that best reflects what you think.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I would contribute to improving things around here regardless of Total Quality	1	2	3	4	5	6	7
The welfare of employees is taken very seriously at this site	1	2	3	4	5	6	7
My knowledge of Total Quality has increased my efforts to find ways of improving things around here	1	2	3	4	5	6	7

SECTION 16

This section asks your view on the following statements at the present time and also what you think your view would have been a year ago.
(Please circle the number that best reflects what you think)

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I often put forward ideas and suggestions without expecting extra reward	1	2	3	4	5	6	7
How would you have answered this question a year ago? I often put forward ideas and suggestions without expecting extra reward	1	2	3	4	5	6	7
In my work area I am always looking for ways to prevent mistakes	1	2	3	4	5	6	7
How would you have answered this question a year ago? In my work area I am always looking for way to prevent mistakes	1	2	3	4	5	6	7
I am not paid to think of ways of improving things around here	1	2	3	4	5	6	7
How would you have answered this question a year ago? I am not paid to think of ways of improving things around here	1	2	3	4	5	6	7
Looking for ways of improving how things are done around here is part of my job	1	2	3	4	5	6	7
How would you have answered this questions a year ago? Looking for ways of improving how things are done around here is part of my job	1	2	3	4	5	6	7
I have put a lot of effort into thinking about how I can improve my work	1	2	3	4	5	6	7
How would you have answered this question a year ago? I have put a lot of effort into thinking about how I can improve my work	1	2	3	4	5	6	7
I am strongly committed to Total Quality	1	2	3	4	5	6	7
How would you have answered this questions a year ago? I am strongly committed to Total Quality	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
To know that I had made a contribution to improving things around here would please me	1	2	3	4	5	6	7

How you have answered this question a year ago?							
To know that I had made a contribution to improving things around here would please me	1	2	3	4	5	6	7

This section asks you how important you think the following features <u>would be</u> in an ideal Total Quality organization and how important they are <u>in practice</u> in this site.

Please rank (from 1 to 5, <u>1 being the most important</u>)

	AN IDEAL TOTAL QUALITY ORGANIZATION	**____ SITE**
Cost reduction	_____	_____
Product quality	_____	_____
Morale	_____	_____
Customer satisfaction	_____	_____
Participation	_____	_____

SECTION 17

Please circle the number that best reflects what you think.

COMPARED TO A YEAR AGO, **In general, people at this site:**

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
Are more willing to put forward ideas and suggestions without expecting extra reward	1	2	3	4	5	6	7
Exert greater effort in looking for way to prevent mistakes	1	2	3	4	5	6	7
Put greater effort into thinking about how they can improve their work	1	2	3	4	5	6	7
Take greater pride in knowing they had made a contribution toward improving things around here	1	2	3	4	5	6	7
Are more quality conscious	1	2	3	4	5	6	7

SECTION 18

(Please circle the appropriate number)

Do you have the same immediate boss as you did when you completed the previous questionnaire? Yes 1 No 0

Has the content of your job changed substantially since you completed the previous questionnaire? Yes 1 No 0

Have you changed jobs since you completed the previous questionnaire? Yes 1 No 0

SECTION 19

Here are some views on Working Together To Win (WTTW). Please circle the number that best reflects what you think.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
WTTW is a top priority at this site	1	2	3	4	5	6	7
There is a lot of active support for WTTW among managers	1	2	3	4	5	6	7
There is a lot of active support for WTTW among worker in general	1	2	3	4	5	6	7
My immediate boss is strongly committed to WTTW	1	2	3	4	5	6	7
My immediate boss involves me in WTTW	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
My immediate boss has changed his/her behaviour as a result of WTTW	1	2	3	4	5	6	7
Management and employees will benefit equally from WTTW	1	2	3	4	5	6	7
WTTW will benefit me in my job	1	2	3	4	5	6	7
WTTW has improved communications between management and employees	1	2	3	4	5	6	7
WTTW has resulted in better relations between management and employees	1	2	3	4	5	6	7
WTTW is an appropriate way to bring about the type of change needed at this site	1	2	3	4	5	6	7
WTTW is not better or worse than previous initiatives	1	2	3	4	5	6	7
WTTW is not part of my job	1	2	3	4	5	6	7
There is no benefit for me in WTTW	1	2	3	4	5	6	7
WTTW is a management initiative to get people to do more work	1	2	3	4	5	6	7

How well informed do you feel about the aims and objectives of <u>Working Together to Win?</u>

Very well informed	5
Fairly well informed	4
Reasonably well informed	3
Not very well informed	2
Not at all informed	1

How well informed do you feel about what is expected of you in <u>Working Together To Win?</u>

Very well informed	5
Fairly well informed	4
Reasonably well informed	3
Not very well informed	2
Not at all informed	1

SECTION 20a

This section is about Total Productive Maintenance (TPM). If TPM does not apply to your work area (i.e. you are in a non-manufacturing work area) please go to SECTION 21.

Are you implementing TPM practices in your work area?

Yes 1 No 0

IF YOUR ANSWER IS YES PLEASE ANSWER THE FOLLOWING QUESTIONS.

IF YOUR ANSWER IS NO PLEASE GO TO SECTION 20b.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
TPM has had no effect on the performance of my work area	1	2	3	4	5	6	7
TPM has had no effect on my job performance	1	2	3	4	5	6	7
TPM allows the people who work for me to become more involved in their work	1	2	3	4	5	6	7
TPM benefits me in my work	1	2	3	4	5	6	7

PLEASE GO TO SECTION 21

SECTION 20b

If there is a plan to implement TPM in your work area please answer the following questions. Otherwise please go to Section 21 on the next page.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
TPM will have no effect on the performance of my work area	1	2	3	4	5	6	7
TPM will have no effect on my job performance	1	2	3	4	5	6	7
TPM will allow the people who work for me to become more involved in their work	1	2	3	4	5	6	7
TPM will benefit me in my work	1	2	3	4	5	6	7

SECTION 21

(Please circle the most appropriate number)

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I liked the WTTW training	1	2	3	4	5	6	7
The WTTW training lived up to my expectations	1	2	3	4	5	6	7
I learned a lot from the WTTW training	1	2	3	4	5	6	7
There is a lot of lip service paid to WTTW	1	2	3	4	5	6	7
I feel I have participated in the design of WTTW	1	2	3	4	5	6	7
I have autonomy with regard to implementing WTTW in my work area	1	2	3	4	5	6	7
My colleagues would say I am committed to WTTW	1	2	3	4	5	6	7
WTTW is an important part of my job	1	2	3	4	5	6	7
It has been quite easy to transfer the WTTW training to the workplace	1	2	3	4	5	6	7
My immediate boss supports me in my attempts to practice the principles of WTTW	1	2	3	4	5	6	7
There is a clear consensus as to what WTTW is about	1	2	3	4	5	6	7
WTTW has had a major impact on how I manage the people who work for me	1	2	3	4	5	6	7
What I have learned form the WTTW training has been very useful in my job	1	2	3	4	5	6	7
I am practising the principles of WTTW	1	2	3	4	5	6	7
WTTW has provided the opportunity for greater contact between different work areas/departments	1	2	3	4	5	6	7
I have kept the people who work for me well informed about WTTW	1	2	3	4	5	6	7

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
WTTW adds too much to my workload	1	2	3	4	5	6	7
There is a lot of pressure here to practice the principles of WTTW	1	2	3	4	5	6	7
I am well informed of my role in WTTW	1	2	3	4	5	6	7
The people who work for me are willing to participate in WTTW	1	2	3	4	5	6	7
WTTW will definitely achieve its objectives	1	2	3	4	5	6	7
WTTW has resulted in a greater sharing of information between work areas/departments	1	2	3	4	5	6	7
WTTW has had no effect on the performance of my work area	1	2	3	4	5	6	7
I am rewarded for my participation in WTTW	1	2	3	4	5	6	7
WTTW has increased my knowledge of the needs of other work areas/departments	1	2	3	4	5	6	7
There are strong incentives for me to practice the principles of WTTW	1	2	3	4	5	6	7
WTTW has had a major impact on how I deal with other work areas/departments	1	2	3	4	5	6	7
My efforts to pursue WTTW are recognised	1	2	3	4	5	6	7
My behaviour has changed as a result of WTTW	1	2	3	4	5	6	7
I have involved the people who work for me in WTTW	1	2	3	4	5	6	7
WTTW has had no effect on my job performance	1	2	3	4	5	6	7
To date WTTW has been successful	1	2	3	4	5	6	7

THANK YOU VERY MUCH FOR YOUR COOPERATION

APPENDIX 2: Sample characteristics for site 2

		Site 2	
1. Mean Age (S.D)		37.5 years	(10.0)
2. Length of time in present job (S.D)		4.2 years	(3.5)
3. Length of service with organization (S.D)		7.6 years	(6.2)
4. Length of service at site (S.D)		7.4 years	(5.77)
5. Gender			
Male	(% of sample)	207	(91%)
Female	(% of sample)	21	(9%)
6. Job Categories			
Manufacturers	(% of sample)	113	(49.4%)
Engineers & Research	(% of sample)	43	(19.0%)
Clerical/Administrative	(% of sample)	27	(11.7%)
Supervisors/Managers	(% of sample)	45	(19.9%)

APPENDIX 3: Intercorrelations

Table I

Intercorrelations among team orientation model variables (antecedent and control variables) at time 1[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Job Tenure	—										
2. Age	.34**	—									
3. Gender	-.01	-.13**	—								
4. Length of Service	.42**	.51**	-.06	—							
5. Job Title	-.14**	-.08	.10*	.18**	—						
6. Satisfaction with colleagues	.03	.06	-.07	.05	-.10*	—					
7. Trust in colleagues	-.01	.13**	-.09**	.08	-.04	.52**	—				
8. Quality awareness	-.08	.10*	-.17**	.02	.16**	.09	.22**	—			
9. Supervisor participative style	-.02	.11*	-.11*	.01	-.05	.28**	.40**	.16**	—		
10. Management commitment to quality	.02	.16**	.01	.08	.11*	.05	.30**	.28**	.44**	—	
11. Team orientation	-.04	.14**	-.14**	.02	-.09	.45**	.54**	.36**	.52**	.33**	—

[a]Overall sample

*p<.05

**p<.01

Table II

Intercorrelations among team orientation model variables (antecedent and control variables) at time 2[a]

	1	2	3	4	5	6	7	8	9	10
1. Job Tenure	—									
2. Age	.32**	—								
3. Gender	-.02	-.14**	—							
4. Length of Service	.34**	.50**	-.06	—						
5. Job Title	-.15**	-.08	.08	.17**	—					
6. Δ in supervisor	.13**	.16**	.02	.11*	-.03	—				
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—			
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46**	—		
9. Satisfaction with colleagues	.00	.02	-.05	.06	.01	.04	.02	.03	—	
10. Trust in colleagues	-.01	.07	-.07	.04	-.06	.00	.04	.02	.54**	—
11. Quality awareness	-.03	.02	-.19**	.02	.12**	-.10*	.12**	.09	.03	.11*
12. Supervisor participative style	.08	.19**	-.01	.09*	-.02	-.02	.01	-.03	.32**	.46**
13. Management commitment to quality	.06	.30**	.03	.23**	.08	.08	-.03	-.01	.18**	.31**
14. Improvement in commitment to quality	.05	.25**	.02	.12**	-.01	-.02	-.01	-.04	.15**	.33**
15. Team orientation	.01	.16**	-.10	.07	-.09	.04	-.01	-.06	.44**	.58**

[a]Overall Sample

*p<.05

**p<.01

Table II
(continued)

	11	12	13	14	15
1. Job Tenure					
2. Age					
3. Gender					
4. Length of Service					
5. Job Title					
6. Δ in supervisor					
7. Δ in job content					
8. Δ in jobs					
9. Satisfaction with colleagues					
10. Trust in colleagues					
11. Quality awareness	—				
12. Supervisor participative style	.10*	—			
13. Management commitment to quality	.14**	.45**	—		
14. Improvement in commitment to quality	.13**	.38**	.53**	—	
15. Team orientation	.22**	.55**	.46**	.44**	—

[a]Overall Sample
*p<.05
**p<.01

Table III

Intercorrelations among variables in the evaluation model of team orientation at time 2[a]

	1	2	3	4	5	6	7	8	9	10
1. Job Tenure	—									
2. Age	.24**	—								
3. Gender	.05	.06	—							
4. Length of Service	.21**	.44**	-.02	—						
5. Job Title	-.16**	-.11	.00	.22**	—					
6. Δ in supervisor	.14*	.17*	-.06	.03	-.16*	—				
7. Δ in job content	-.09	-.14*	.11	.00	.19**	-.24**	—			
8. Δ in jobs	-.24**	-.20**	.01	-.04	.16*	-.28**	.43**	—		
9. Participation in TQM	-.01	.01	-.01	-.06	.16*	-.03	.09	-.12	—	
10. Perceived benefit	-.22**	-.07	-.04	.01	.30**	-.03	.22**	.24**	.41**	—
11. Perceived appropriateness	-.11	.06	-.01	-.07	.09	-.08	.15*	.09	.35**	.55**
12. Supervisory reinforcement	.01	.13*	.12	-.03	.09	-.06	.20**	-.03	.45**	.28**
13. Satisfaction with colleagues	.00	-.07	-.10	.02	-.02	.03	.11	.02	.11	.12
14. Trust in colleagues	-.03	-.03	-.07	-.01	-.05	.01	.18**	.01	.18*	.13*
15. Quality awareness	-.04	-.09	-.14*	-.02	.09	-.08	.14*	.15*	.09	.16*
16. Supervisor participative style	.05	.11	.06	-.01	-.06	-.08	.17*	.07	.28**	.25**
17. Management commitment to quality	-.04	.10	.06	.01	.07	-.05	.17*	.10	.23**	.35**
18. Improvement in commitment to quality	-.06	.02	.07	-.10	.01	-.06	.19**	.10	.32**	.39**
19. Team orientation	-.09	-.01	-.06	-.03	.01	-.06	.19*	.09	.33**	.25**

[a]Site 1

*p<.05

**p<.01

Table III
(continued)

	11	12	13	14	15	16	17	18	19
1. Job Tenure									
2. Age									
3. Gender									
4. Length of Service									
5. Job Title									
6. Δ in supervisor									
7. Δ in job content									
8. Δ in jobs									
9. Participation in TQM									
10. Perceived benefit									
11. Perceived appropriateness	—								
12. Supervisory reinforcement	.49**	—							
13. Satisfaction with colleagues	.19**	.18**	—						
14. Trust in colleagues	.18**	.35**	.61**	—					
15. Quality awareness	.21**	.14**	.06	.13*	—				
16. Supervisor participative style	.36**	.49**	.19**	.39**	.21**	—			
17. Management commitment to quality	.46**	.45**	.22**	.33**	.24**	.53**	—		
18. Improvement in commitment to quality	.46**	.43**	.26**	.33**	.14*	.33**	.43**	—	
19. Team orientation	.37**	.44**	.45**	.58**	.30*	.49**	.43**	.38**	—

[a] Site 1
*p<.05
**p<.01

Table IV

Intercorrelations among variables in the evaluation model of team orientation using change data[a]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Job Tenure	—														
2. Age	.32**	—													
3. Gender	-.02	-.14**	—												
4. Length of Service	.34**	.50**	-.05	—											
5. Job Title	-.15**	-.08	.08	.17**	—										
6. Δ in supervisor	.13**	.16**	.02	.11*	-.03	—									
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—								
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46*	—							
9. Δ in satisfaction with colleagues	-.03	-.03	.04	.01	.09*	.03	-.02	.06	—						
10. Δ in trust in colleagues	-.03	-.04	.03	-.03	-.02	-.01	.00	.10*	.35**	—					
11. Δ in quality awareness	.06	-.09*	.02	-.01	-.06	-.05	.00	-.05	.07	.13**	—				
12. Δ in supervisor participative style	.09*	.09	.10*	.08	.01	-.04	-.02	-.03	.16**	.25**	.06	—			
13. Δ in management commitment to quality	.12**	.19**	.02	.19**	-.02	.04	-.01	-.04	.08	.18**	.09*	.23**	—		
14. Improvement in commitment to quality	.05	.25**	.02	.12**	-.01	-.02	-.01	-.04	.06	.05	.00	.10*	.34**	—	
15. Δ in team orientation	.04	.01	.07	.04	.00	.04	-.06	-.04	.34**	.35**	.18**	.30**	.21**	.12*	—

[a] Site 1

*p<.05

**p<.01

Table V

Intercorrelations among commitment to improvement model variables (antecedent and control variables) at time 2[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Job Tenure	—										
2. Age	.32**	—									
3. Gender	-.02	-.14**	—								
4. Length of Service	.34**	.50**	-.05	—							
5. Job Title	-.15**	-.08	.08	.17**	—						
6. Δ in supervisor	.13**	.16**	.02	.11*	-.03	—					
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—				
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46**	—			
9. General orientation to quality	.01	.14**	-.10*	.06	.19**	-.04	.11*	.05	—		
10. Improvement as part of job	-.09*	-.09*	-.05	.06	.49**	.00	.16**	.14**	.47**	—	
11. Intrinsic motivation	.04	.16**	-.04	.03	.01	-.01	.09*	.01	.59**	.28**	—
12. Management commitment to quality	.06	.30**	.03	.23**	.08	.08	-.03	-.01	.37**	.20**	.20**
13. Supervisory commitment to quality	.04	.13**	.00	.04	.02	-.05	.07	.00	.34**	.22**	.25**
14. Organizational commitment	.10*	.28**	.07	.19**	.05	.02	-.01	.02	.48**	.28**	.39**
15. Higher order need strength	-.06	-.09*	-.01	-.01	.13**	.01	.09*	.06	.43**	.28**	.40**
16. Quality awareness	-.03	.02	-.19**	.02	.12**	-.10*	.12**	.09	.50**	.33**	.43**
17. Improvement in quality climate	.06	.29**	.00	.22**	.12**	.05	.01	.00	.41**	.22**	.22**
18. Improvement in commitment to quality	.05	.25**	.02	.12**	-.01	-.02	-.01	-.04	.36**	.17**	.25**

[a] Total sample

*p<.05

**p<.01

Table V
(continued)

	12	13	14	15	16	17	18
1. Job Tenure							
2. Age							
3. Gender							
4. Length of Service							
5. Job Title							
6. Δ in supervisor							
7. Δ in job content							
8. Δ in jobs							
9. General orientation to quality							
10. Improvement as part of job							
11. Intrinsic Motivation							
12. Management commitment to quality	—						
13. Supervisory commitment to quality	.48**	—					
14. Organizational commitment	.61**	.45**	—				
15. Higher order need strength	.12*	.15**	.23**	—			
16. Quality awareness	.14**	.11*	.18**	.41**	—		
17. Improvement in quality climate	.72**	.46**	.57**	.15**	.15**	—	
18. Improvement in commitment to quality	.55**	.39**	.47**	.08	.13**	.66**	—

[a] Total sample
*p<.05
**p<.01

Table VI

Intercorrelations among commitment to improvement model variables (antecedent and control variables) using change data[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Job Tenure	—										
2. Age	.32**	—									
3. Gender	-.02	-.14**	—								
4. Length of Service	.34**	.50**	-.05	—							
5. Job Title	-.15**	-.08	.08	.17**	—						
6. Δ in supervisor	.13**	.16**	.02	.11*	-.03	—					
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—				
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46**	—			
9. Δ in general orientation to quality	.08	.08	.00	.07	.01	-.01	.00	-.11*	—		
10. Δ in improvement as part of job	.06	.02	.02	.02	-.02	.01	.01	-.10*	.50**	—	
11. Δ in intrinsic motivation	-.01	-.02	-.04	.00	.00	.03	.05	-.03	.04	.05	—
12. Δ in management commitment to quality	.12**	.19**	.02	.19**	-.02	.04	-.01	-.04	.21**	.15**	.09
13. Δ in supervisory commitment to quality	.11*	.01	.09*	.04	.01	-.09*	.04	-.01	.23**	.20**	.08
14. Δ in organizational commitment	.10*	.07	.04	.09*	-.01	.01	-.05	-.07	.16**	.17**	.17**
15. Δ in higher order need strength	-.03	.03	-.01	.05	.02	.01	-.05	-.05	.01	-.01	.21**
16. Δ in quality awareness	.06	-.09*	.02	.00	-.06	-.05	.00	-.05	.01	.00	.17**
17. Improvement in quality climate	.06	.29**	.00	.22**	.12**	.05	.01	.00	.32**	.29**	.09*
18. Improvement in commitment to quality	.05	.25**	.02	.12**	-.01	-.02	-.01	-.04	.31**	.25**	.11*

[a] Total sample

*p<.05

**p<.01

Table VI
(continued)

	12	13	14	15	16	17	18
1. Job Tenure							
2. Age							
3. Gender							
4. Length of Service							
5. Job Title							
6. Δ in supervisor							
7. Δ in job content							
8. Δ in jobs							
9. Δ in general orientation to quality							
10. Δ in improvement as part of job							
11. Δ in intrinsic motivation							
12. Δ in management commitment to quality	—						
13. Δ in supervisory commitment to quality	.29**	—					
14. Δ in organizational commitment	.39**	.15**	—				
15. Δ in higher order need strength	.05	.05	.22**	—			
16. Δ in quality awareness	.09*	.03	.19**	.18**	—		
17. Improvement in quality climate	.49**	.16**	.30**	.10*	.00	—	
18. Improvement in commitment to quality	.34**	.12**	.26**	.03	.00	.66**	—

[a]Total sample
*p<.05
**p<.01

Table VII

Intercorrelations among variables in the evaluation model of commitment to improvement at time 2[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Job Tenure	—										
2. Age	.32**	—									
3. Gender	-.02	-.14**	—								
4. Length of Service	.34**	.50**	-.06	—							
5. Job Title	-.15**	-.08	.08	.17**	—						
6. Δ in supervisor	.13**	.16**	.02	.11*	-.03	—					
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—				
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46**	—			
9. General orientation to quality	.01	.14**	-.10*	.06	.19**	-.04	.11*	.05	—		
10. Improvement as part of job	-.09*	-.09*	-.05	.07	.49**	.00	.16**	.14**	.47**	—	
11. Intrinsic motivation	.04	.16**	-.04	.03	.01	-.01	.09*	.01	.59**	.28**	—
12. Management commitment to quality	.06	.30**	.03	.23**	.08	.08	-.03	-.01	.37**	.20**	.20**
13. Supervisory commitment to quality	.04	.13**	.00	.04	.02	-.05	.07	.00	.34**	.22**	.25**
14. Organizational commitment	.10*	.28**	.07	.19**	.05	.02	-.01	.02	.48**	.28**	.39**
15. Higher order need strength	-.06	-.09*	-.01	-.01	.13**	.01	.09*	.06	.43**	.28**	.40**
16. Quality awareness	-.03	.02	-.19**	.02	.12**	-.10*	.12**	.09	.50**	.33**	.43**
17. Improvement in quality climate	.06	.29**	.00	.22**	.12**	.05	.01	.00	.41**	.22**	.22**
18. Improvement in commitment to quality	.05	.25**	.02	.12**	-.01	-.02	-.01	-.04	.36**	.17**	.25**
19. Participation in TQM intervention	-.06	-.01	-.06	-.08	.17*	-.10	.18*	-.04	.31**	.28**	.23**
20. Perceived benefit	-.22**	-.07	-.04	.01	.30**	-.03	.22**	.24**	.30**	.49**	.21**
21. Perceived appropriateness	-.11	.06	-.01	-.07	.09	-.08	.15*	.09	.37**	.20**	.26**
22. Supervisory reinforcement	.01	.13*	.12	-.03	.09	-.06	.20**	-.03	.24**	.14**	.20**

[a] Site 1

*p<.05 **p<.01

Table VII
(continued)

	12	13	14	15	16	17	18	19	20	21	22
1. Job Tenure											
2. Age											
3. Gender											
4. Length of Service											
5. Job Title											
6. Δ in supervisor											
7. Δ in job content											
8. Δ in jobs											
9. General orientation to quality											
10. Improvement as part of job											
11. Intrinsic motivation											
12. Management commitment to quality	—										
13. Supervisory commitment to quality	.48**	—									
14. Organizational commitment	.61**	.45**	—								
15. Higher order need strength	.12*.	.15**	.23**	—							
16. Quality awareness	.14**	.11*	.18**	.41**	—						
17. Improvement in quality climate	.72**	.46**	.57**	.15**	.15**	—					
18. Improvement in commitment to quality	.53**	.39**	.47**	.08	.13**	.66**	—				
19. Participation in TQM intervention	.24**	.41**	.27**	.16*	.13	.51**	.41**	—			
20. Perceived benefit	.35**	.30**	.30**	.17*	.16*	.44**	.39**	.43**	—		
21. Perceived appropriateness	.46**	.34**	.43**	.24**	.21**	.52**	.46**	.41**	.55**	—	
22. Supervisory reinforcement	.45**	.54**	.32**	.18**	.14*	.55**	.43**	.51**	.28**	.49**	—

[a] Site 1

*p<.05

**p<.01

Table VIII

Intercorrelations among variables in the evaluation model of commitment to improvement using change data[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Job Tenure	—										
2. Age	.32**	—									
3. Gender	-.02	-.14**	—								
4. Length of Service	.34**	.50**	-.05	—							
5. Job Title	-.15**	-.08	.08	.17**	—						
6. Δ in supervisor	.13**	.16**	.02	.11*	.03	—					
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—				
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46**	—			
9. General orientation to quality	.08	.08	.00	.07	.01	-.06	.00	-.11*	—		
10. Improvement as part of job	.06	.02	.02	.02	-.02	.00	.01	-.10*	.50**	—	
11. Intrinsic motivation	-.01	-.02	-.04	.00	.00	.03	.05	-.03	.04	.05	—
12. Management commitment to quality	.12**	.19**	.02	.19**	-.02	.04	-.01	-.04	.21**	.15**	.09
13. Supervisory commitment to quality	.11*	.01	.09*	.04	.01	-.09*	.04	-.04	-.01	.23**	.08
14. Organizational commitment	.10*	.08	.04	.09*	-.01	.01	-.05	-.07	.16**	.17**	.17**
15. Higher order need strength	-.03	.03	-.01	.05	.02	.01	-.05	-.05	.01	-.01	.21**
16. Quality awareness	.06	-.09*	.02	.00	-.06	-.05	.00	-.05	.00	.00	.17**
17. Improvement in quality climate	.06	.29**	.00	.22**	.12**	.05	.01	.00	.32**	.29**	.09*
18. Improvement in commitment to quality	.05	.25**	.02	.12**	-.01	-.02	-.01	-.04	.31**	.25**	.11*
19. Participation in TQM intervention	-.06	-.01	-.06	-.08	.17*	-.10	.18*	-.04	.14	.10	.07
20. Perceived benefit	-.22**	-.07	-.04	.01	.30**	-.03	.22**	.24**	-.04	.00	.12
21. Perceived appropriateness	-.11	.06	-.01	-.07	.09	-.08	.15*	.09	.11	.13	.00
22. Supervisory reinforcement	.01	.13*	.12	-.03	.09	-.06	.20**	-.03	.16*	.14*	.01

[a] Site 1

*p<.05**p<.01

Table VIII
(continued)

	12	13	14	15	16	17	18	19	20	21	22
1. Job Tenure											
2. Age											
3. Gender											
4. Length of Service											
5. Job Title											
6. Δ in supervisor											
7. Δ in job content											
8. Δ in jobs											
9. General orientation to quality											
10. Improvement as part of job											
11. Intrinsic motivation											
12. Management commitment to quality	—										
13. Supervisory commitment to quality	.29**	—									
14. Organizational commitment	.39**	.15**	—								
15. Higher order need strength	.05	.05	.22**	—							
16. Quality awareness	.09	.03	.19**	.18**	—						
17. Improvement in quality climate	.49**	.16**	.30**	.10*	.00	—					
18. Improvement in commitment to quality	.34**	.12**	.26**	.03	.00	.66**	—				
19. Participation in TQM intervention	.19*	.13	.25**	-.03	-.02	.51**	.41**	—			
20. Perceived benefit	.13*	.10	.10	-.04	-.06	.44**	.39**	.43**	—		
21. Perceived appropriateness	.13*	.06	.09	-.02	-.05	.52**	.46**	.41**	.55**	—	
22. Supervisory reinforcement	.19**	.20**	.26**	.09	.02	.55**	.43**	.51**	.28*	.49**	—

[a]Site 1

*p<.05**p<.01

Table IX

Intercorrelations between independent variables (time 1) and dependent variable (time 2)[a]

	1	2	3	4	5	6	7	8	9	10	11
1. Job Tenure	—										
2. Age	.25**	—									
3. Gender	.04	.03	—								
4. Length of Service	.26**	.46**	-.06	—							
5. Job Title 2	.01	-.01	-.09	.21**	—						
6. Job Title 3	-.02	-.14*	.37**	.01	-.10	—					
7. Supervisory participative style	-.01	.03	-.05	-.03	.02	-.01	—				
8. Organizational commitment	.12	.14*	.09	.04	-.06	-.06	.17**	—			
9. Higher order need strength	.03	-.12	-.10	-.10	.03	.04	.19**	.28**	—		
10. Influence gap	-.04	-.08	-.05	-.11	.02	-.01	-.22**	-.14*	.06	—	
11. Participation in TQM	.04	-.01	-.06	-.07	.04	.13	.30**	.08	.22**	.07	—

[a]Site 1

*p<.05

**p<.01

Table X

Intercorrelations among full assessment model variables[a]

	1	2	3	4	5	6	7	8	9	10
1. Job Tenure	—									
2. Age	.30**	—								
3. Gender	.01	.03	—							
4. Length of Service	.35**	.43**	-.03	—						
5. Job Title 2	-.02	-.02	-.11	.31**	—					
6. Job Title 3	-.05	-.18*	.38**	.04	-.13	—				
7. Supervisory participative style	.06	.04	-.07	-.01	.01	-.02	—			
8. Organizational commitment	.11	.14	.11	.00	-.07	.07	.16*	—		
9. Higher order need strength	.04	-.16*	-.11	-.13	.04	.05	.14	.26**	—	
10. Influence gap	-.07	-.04	-.06	-.06	-.01	-.04	-.23**	-.11	.13	—
11. Participation in TQM	.04	-.01	-.06	-.07	.04	.13	.30**	.08	.22**	.07
12. Benefit of intervention	-.10	-.03	.02	-.04	.06	.12	.23**	.22**	.20**	-.01
13. Appropriateness of intervention	-.05	.04	.03	-.13	-.17*	.01	.35**	.39**	.25**	-.01
14. Supervisory reinforcement of intervention	-.02	.14	.17*	-.04	-.04	.12	.38**	.12	.04	.01
15. Previous experience 1	-.11	-.23**	-.07	-.22**	.08	.16*	.14	.19*	.22**	.04
16. Previous experience 2	.07	-.07	.01	-.01	.11	.08	.07	-.03	.01	.02
17. Previous experience 3	.18*	-.11	-.13	-.24**	-.02	-.04	.00	.16*	.18*	.06
18. Previous experience 4	-.02	-.01	.01	.01	.02	.15*	-.14	.03	.00	.02
19. Previous experience 5	-.05	-.11	.01	-.04	-.04	.07	.28**	.13	.15	-.07

[a]Site 1

*p<.05

**p<.01

Table X
(continued)

	11	12	13	14	15	16	17	18	19
1. Job Tenure									
2. Age									
3. Gender									
4. Length of Service									
5. Job Title 2									
6. Job Title 3									
7. Supervisory participative style									
8. Organizational commitment									
9. Higher order need strength									
10. Influence gap									
11. Participation in TQM	—								
12. Benefit of intervention	.43**	—							
13. Appropriateness of intervention	.41**	.54**	—						
14. Supervisory reinforcement of intervention	.51**	.29**	.47**	—					
15. Previous experience 1	.17*	.28**	.29**	.12	—				
16. Previous experience 2	.04	.03	.04	.03	.52**	—			
17. Previous experience 3	.12	.13	.17*	.09	.36**	-.31**	—		
18. Previous experience 4	.01	.05	.04	-.05	.20**	-.17*	-.12	—	
19. Previous experience 5	.06	.21**	.18*	.09	.20**	-.17*	-.12	-.07	—

[a]Site 1
*p<.05
**p<.01

Table XI

Intercorrelations among supervisor participative style model variables at time 2[a]

	1	2	3	4	5	6	7	8	9
1. Employee perception of supervisor participative style†	—								
2. Employee perception of supervisory reinforcement of intervention†	.42*	—							
3. Supervisory commitment to quality	.18	-.09	—						
4. Supervisor participative style	.05	.04	.83**	—					
5. Behavioural commitment to the intervention	-.17	.39*	.24	.16	—				
6. Supervisory reinforcement of the intervention	.12	.02	.54**	.49**	.24	—			
7. Perceived benefit of the intervention	.18	.03	.30**	.25**	.48**	.28**	—		
8. Theory Y	-.11	.03	.07	.05	.26	.09	.17	—	
9. Theory X	-.28	.00	.09	.08	-.19	-.11	-.20	-.46**	—

[a]Site 1

† subordinate group mean response

* p<.05

** p<.01

Table XII

Intercorrelations among supervisor commitment to quality model variables at time 2[a]

	1	2	3	4	5	6	7	8	9
1. Employee perception of supervisory commitment to quality†	—								
2. Employee perception of supervisory reinforcement of intervention†	.45*	—							
3. Supervisory commitment to quality	.16	-.09	—						
4. Supervisor participative style	.13	.04	.83**	—					
5. Behavioural commitment to intervention	-.23	.39*	.24	.16	—				
6. Supervisory reinforcement of the intervention	.09	.02	.54**	.49**	.24	—			
7. Perceived benefit of the intervention	.22	.03	.30**	.25**	.48**	.28**	—		
8. Theory Y	-.13	.03	.07	.06	.26	.09	.17	—	
9. Theory X	-.16	.01	.09	.08	-.19	-.11	-.20	-.46**	—

[a]Site 1

† subordinate group mean response

* p<.05

** p<.01

Table XIII

Intercorrelations among variables in the performance improvement model at time 2[a]

	1	2	3	4	5	6	7	8
1. Job Tenure	—							
2. Age	.32**	—						
3. Gender	-.02	-.14**	—					
4. Length of Service	.34**	.50**	-.05	—				
5. Job Title	-.15**	-.08	.08	.17**	—			
6. Δ in supervisor	.13**	.16**	.02	.11*	-.03	—		
7. Δ in job content	-.19**	-.28**	.05	-.12**	.13**	-.35**	—	
8. Δ in jobs	-.29**	-.24**	.03	-.08	.08	-.32**	.46**	—
9. Team orientation	.01	.15**	-.10	.07	-.09	.04	-.01	-.06
10. Intrinsic motivation	.04	.16**	-.04	.03	.01	-.01	.09*	.01
11. General orientation to quality	.01	.14**	-.10*	.06	.19**	-.04	.11*	.05
12. Improvement as part of the job	-.09*	-.09*	-.05	.06	.49**	.00	.16**	.14**
13. Participation in TQM	-.06	-.01	-.06	-.08	.17*	-.10	.18*	-.04
14. Perceived benefit of intervention	-.22**	-.07	-.04	.01	.30**	-.03	.22**	.24**
15. Perceived appropriateness of intervention	-.11	.06	-.01	-.07	.09	-.08	.15*	.09
16. Supervisory reinforcement of intervention	.01	.13*	.12	-.04	.09	-.06	.20**	-.03
17. Perceived performance improvement	-.13**	.02	-.02	.01	.25**	-.08	.15**	.08

[a]Site 1

* p<.05

** p<.01

Table XIII
(continued)

	9	10	11	12	13	14	15	16	17
1. Job Tenure									
2. Age									
3. Gender									
4. Length of Service									
5. Job Title									
6. Δ in supervisor									
7. Δ in job content									
8. Δ in jobs									
9. Team orientation	—								
10. Intrinsic motivation	.36**	—							
11. General orientation to quality	.43**	.59**	—						
12. Improvement as part of the job	.22**	.28**	.47**	—					
13. Participation in TQM	.44**	.23**	.31**	.28**	—				
14. Perceived benefit of intervention	.25**	.21**	.30**	.49**	.43**	—			
15. Perceived appropriateness of intervention	.37**	.26**	.37**	.20**	.41**	.55**	—		
16. Supervisory reinforcement of intervention	.44**	.20**	.24**	.14*	.51**	.28**	.49**	—	
17. Perceived performance improvement	.35**	.16**	.37**	.33**	.46**	.33**	.35**	.44**	—

[a]Site 1
* p<.05
** p<.01

APPENDIX 4: Cross Lagged Regressions (Site 1)

	TIME 2					
TIME 1	Sat. with Coll.	Trust in Coll.	Quality aware	Sup. partic. style	Mgt. commit to quality	Team orientation
Job Tenure						
Age						
Gender						
Length of service						
Job Title 2			-.18**			
Job Title 3						
Satisfaction with colleagues	.17**					
Trust in colleagues	.24**	.53***				
Quality awareness			.58***	.14**		
Sup. participative style		.16**		.38***		.30***
Mgt. commitment to quality					.51***	
Team orientation						.44***

**= p<.05 ***=p<.01

APPENDIX 5: Cross Lagged Regressions (Site 2)

	TIME 2					
TIME 1	Sat. with Coll.	Trust in Coll.	Quality aware	Sup. partic. style	Mgt. commit to quality	Team orientation
Job Tenure						
Age						
Gender						
Length of service						
Job Title 2		-.14**			-.14**	
Job Title 3		-.20**	-.15**			
Satisfaction with colleagues						
Trust in colleagues		.36***				
Quality awareness	-.20**		.57***			
Sup. participative style				.23**		
Mgt. commitment to quality					.55***	.20***
Team orientation						.26***

**= p<.05 ***=p<.01

APPENDIX 6: Factor analysis of items measuring team orientation and trust in colleagues (site 1)

Item	Factor 1	Factor 2
Most of my workmates can be relied upon to do as they say they will do	.80°	.18
Most of my fellow workers would get on with the job even if supervisors are not around	.79°	-.02
I have full confidence in the skills of my workmates	.79°	.27
I can trust the people I work with to lend me a hand if I need it	.77°	.34
If I got into difficulties at work I know my workmates would try and help out	.71°	.31
I am willing to put myself out to help my workgroup	.00	.84°
I feel I am really part of my workgroup	.26	.76°
The people in my work group encourage each other to work as a team	.47	.56°
I can rely on other workers not to make my job more difficult by careless work	.46	.46°
Eigenvalue	4.49	1.17
Percent of variance	49.9	13.0

°indicates factor on which item loads most highly

APPENDIX 7: Factor analysis of items measuring team orientation and trust in colleagues (site 2)

Item	Factor 1	Factor 2
I can trust the people I work with to lend me a hand if I need it	.89°	.05
If I got into difficulties at work I know my workmates would try and help out	.88°	.04
I have full confidence in the skills of my workmates	.76°	.33
Most of my workmates can be relied upon to do as they say they will do	.74°	.32
I can rely on other workers not to make my job more difficult by careless work	.63°	.21
Most of my fellow workers would get on with the job even if supervisors are not around	.41°	.38
I am willing to put myself out to help my workgroup	-.09	.88°
The people in my work group encourage each other to work as a team	.54	.61°
I feel I am really part of my workgroup	.42	.55°
Eigenvalue	4.49	1.16
Percent of variance	50.0	12.9

°indicates factor on which item loads most highly

APPENDIX 8: Factor analysis of items measuring management commitment to quality and improvement in commitment to quality at the site (site 1)

Item	Factor 1	Factor 2
Compared to a year ago, in general, people at the site:		
Exert greater effort in looking for ways to prevent mistakes	.91°	.19
Put greater effort into thinking about how they can improve their work	.89°	.17
Take greater pride in knowing they had made a contribution toward improving things around here	.86°	.21
Are more quality conscious	.84°	.23
Are more willing to put forward ideas and suggestions without expecting extra reward	.73°	.15
Management provides support for quality improvements throughout the organization	.20	.86°
Management has attempted to involve everyone in continuous improvement	.09	.79°
Management is genuinely committed to improving quality	.27	.75°
Management does its best to provide employees with the right tools and materials to do a quality job	.08	.74°
Management sets examples of quality performance in their daily activities	.33	.72°
Eigenvalue	5.14	1.92
Percent of variance	51.5	19.3

° indicates factor on which item loads most highly

APPENDIX 9: Factor analysis of items measuring management commitment to quality and improvement in commitment to quality at the site (site 2)

Item	Factor 1	Factor 2
Management provides support for quality improvements throughout the organization	.86°	.12
Management is genuinely committed to improving quality	.78°	.15
Management has attempted to involve everyone in continuous improvement	.73°	.20
Management sets examples of quality performance in their daily activities	.70°	.22
Management does its best to provide employees with the right tools and materials to do a quality job	.70°	.08
Compared to a year ago, in general, people at the site:		
Put greater effort into thinking about how they can improve their work	.13	.87°
Exert greater effort in looking for ways to prevent mistakes	.11	.86°
Take greater pride in knowing they had made a contribution toward improving things around here	.20	.83°
Are more willing to put forward ideas and suggestions without expecting extra reward	.09	.63°
Are more quality conscious	.38	.57°
Eigenvalue	4.35	1.83
Percent of variance	43.6	18.4

° indicates factor on which item loads most highly

APPENDIX 10: Factor analysis of items measuring commitment to improvement (SITE 1)

Item	Factor 1	Factor 2
Strongly committed to Total Quality	.81°	.08
Contribution to improving things would please me	.70°	.15
Put a lot of effort into thinking about how I can improve my work	.70°	.28
Always looking for ways to prevent mistakes	.65°	.25
Looking for ways to improve how things are done is part of my job	.16	.79°
I am not paid to think of ways of improving things†	.11	.77°
I often put forward ideas and suggestions without expecting extra reward	.34	.53°
Eigenvalue	2.90	0.96
Percent of variance	41.7	13.8

° indicates factor on which item loads most highly
† item reversed scored

APPENDIX 11: Factor analysis of items measuring commitment to improvement (SITE 2)

Item	Factor 1	Factor 2
Strongly committed to Total Quality	.77°	.00
Contribution to improving things would please me	.73°	.26
Always looking for ways to prevent mistakes	.71°	.16
Put a lot of effort into thinking about how I can improve my work	.55°	.47
Looking for ways to improve how things are done is part of my job	.26	.80°
I am not paid to think of ways of improving things†	.17	.70°
I often put forward ideas and suggestions without expecting extra reward	.04	.71°
Eigenvalue	2.92	1.06
Percent of variance	41.8	15.2

° indicates factor on which item loads most highly
† item reversed scored

APPENDIX 12: Factor analysis of items measuring intrinsic motivation and commitment to improvement (SITE 1)

Item	Factor 1	Factor 2
Feel unhappy when work is not up to usual standard	.77°	.09
Take pride in doing my job as well as I can	.75°	.17
Feel a sense of personal satisfaction when I do the job well	.75°	.31
Like to look back on the day's work with a sense of a job well done	.74°	.26
Try to think of ways of doing my job effectively	.70°	.31
Opinion of myself goes down when I do this job badly	.64°	-.18
Put a lot of effort into thinking about how I can improve my work	.26	.67°
Looking for ways to improve how thngs are done is part of my job	.10	.65°
I am not paid to think of ways of improving things†	-.05	.65°
I often put foward ideas and suggestion without expecting extra reward	.05	.64°
Always looking for ways to prevent mistakes	.36	.53°
Strongly committed to Total Quality	.43	.52°
Contribution to improving things would please me	.42	.49°
Eigenvalue	4.99	1.62
Percent of variance	38.4	12.5

indicates factor on which item loads most highly
† item reversed scored

APPENDIX 13: Factor analysis of items measuring intrinsic motivation and commitment to improvement (SITE 2)

Item	Factor 1	Factor 2	Factor 3
Feel unhappy when work is not up to usual standard	.83°	.09	.08
Take pride in doing my job as well as I can	.77°	.03	.34
Try to think of ways of doing my job effectively	.76°	.26	.18
Feel a sense of personal satisfaction when I do the job well	.76°	.10	.25
Opinion of myself goes down when I do this job badly	.72°	.09	-.01
Like to look back on the day's work with a sense of a job well done	.56°	.09	.55
Always looking for ways to prevent mistakes	.43°	.36	.19
Looking for ways to improve how things are done is part of my job	.11	.79°	.23
I often put foward ideas and suggestion without expecting extra reward	.13	.73°	-.15
I am not paid to think of ways of improving things†	-.06	.63°	.40
Put a lot of effort into thinking about how I can improve my work	.45	57°	.12
Strongly committed to Total Quality	.15	.08	.84°
Contribution to improving things would please me	.37	.34	.53°
Eigenvalue	5.29	1.61	1.00
Percent of variance	40.7	12.4	7.7

indicates factor on which item loads most highly
† item reversed scored

APPENDIX 14: Predictors of intrinsic motivation and higher order need strength

	Intrinsic Motivation		Higher Order Need Strength	
Predictor variables†	Site 1	Site 2	Site 1	Site 2
Management commitment to quality				
Supervisory commitment to quality		.15**		
Quality awareness	.42***	.35***	.38***	.39***
Organizational commitment	.26***	.31***	.20***	.16**
Intrinsic job satisfaction				
An improvement in quality climate				
An improvement in commitment to quality			-.24***	

**= p<.05 ***=p<.01

† control variables are included but not shown here

APPENDIX 15: Predictors of employee participation using logistic regression

Predictors (Time 1)	Time 2	
	Participation in TQM	Participation in TQM
Job Tenure	.01	.03
Age	.03	.03
Gender	-.42	-.38
Length of service	-.05**	-.05**
Job Title 2	1.06+	.90
Job Title 3	1.56**	1.42*
Supervisor participative style	.71***	.68***
Organizational commitment	-.04	-.21
Higher order need strength	.22	.13
Influence gap	.06	.06
Perceived benefit of TQM intervention†		.73***
N	164	164

**= p<.05 ***=p<.01

† Measured at time 2

APPENDIX 16: Factor analysis of all items measuring improvement

Item	Factor 1	Factor 2	Factor 3
There is greater contact between management and employees	.77°	.27	.22
People are encourage more to say how they think things could be done better	.75°	.25	.22
Visible progress has been made in improving things at the site	.75°	.19	.16
The level of cooperation between management and employees has improved	.74°	.30	.36
Top management is more supportive of suggestions to improve the way things are done around here	.74°	.23	.30
Top management is more committed to Total Quality	.72°	.33	.06
Communications between management and employees has improved	.71°	.28	.31
Total Quality is a greater priority at this site	.69°	.37	.02
People at the site:			
Put greater effort into thinking about how they can improve their work	.23	.87°	.14
Exert greater effort into looking for ways to prevent mistakes	.25	.86°	.15
Take greater pride in knowing they had made a contribution toward improving things around here	.36	.81°	.14
Are more quality conscious	.38	.73°	.07
Are more willing to put forward ideas and suggestions without expecting extra reward	.22	.64°	.19
My performance on the job has improved	.05	.12	.85°
The performance of my work area has improved	.34	.21	.72°
Improvements have been made in how I do my job	.40	.11	.71°
Eigenvalue	8.37	1.62	1.20
Percent of variance	52.3	10.2	7.5

° indicates factor on which item loads most highly

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